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**Shortage of experts—****Sax, we skills:**

After reading Jeff Dues' article on the IT skills shortage in the September issue, that once again

reports the fine about worker shortages in the IT field, I feel compelled to ask one simple question that is never answered in these articles: Where?

Where are these jobs that go begging? And who is doing the begging? Instead of repeating the same line that's been going

around for years now, just once I'd like to see a writer go out and find some of these employers and get them to spell out exactly what they are looking for and why they can't find anyone.

In many cases my guess is that the reason they can't find skilled workers is

because their demands are simply unreasonable—like the ads I have seen at least twice now for a CNE (Certified Novell Engineer) with a minimum of five years experience being offered a salary of \$35 an hour.

Or IT jobs being offered to experienced, certified professionals who are on unemployment for a wage of \$413 a week.

Many professional IT consulting companies now not only want years of experience, full certifications, technical training, but they also demand university degrees, and not necessarily in the computer field.

These are the kinds of demands you make when you want to weed out applicants, not find more.

I work in the IT field, and while I am employed my wages are not what I had been told to expect, plus I had to go out of town to even get this job, so I currently spend three hours a day driving to and from work.

I have years of experience in the field, and held several recognized certifications, but I don't even get called for interviews from anyone to find out if I might qualify. I'm relatively happy in my current job, but I find it curious that given the so-called skilled worker shortage there isn't at least some interest in seeing me.

I think the only shortage is of skilled workers who are experts in all IT fields, who will work for low wages, few benefits, and who will do all the heavy lifting too. (Before you accuse me of exaggerating, I actually saw an ad to that effect once.)

Just do me one favor: before you print another article like this, go out and talk to some of these recruiters or employers yourself.

I think new students in the IT field are being fed a bunch of lies about their chances of getting good jobs. I think people in the field need the truth for a change. Pat Brown, OMA, HCE, Jr., USA

Don't judge us by old software

I have just read the review on PC Accelerator and, as its critics, would like to point out that the version you reviewed is very old and was not meant for current machines such as your review machine.

As such, you will not see as much performance improvement as you would expect. Also, the Web site address you mentioned is wrong. Our current Web site is www.mactab.com.

We are a Toronto-based company, and I enjoy reading *The Computer Paper* as it provides very important information.

The latest version of our software is much better and is optimized for current machine specifications such as the review computer you used for the benchmarks. I hope you take the time to review the latest version.

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WHAT'S NEW

Keyspan ships silver hubs for new G4s



USB connectivity vendor, Keyspan (www.keyspan.com), has announced it has added silver USB hubs to complement Apple's new G4 desktop PowerMac and PowerBook G4 systems.

The new hubs, which are available in desktop and laptop versions, have four USB ports, support dual power modes, and comply with USB 1.1 specifications.

According to Keyspan, the silver-hub version features a low-power design that

extends the battery life of the laptop.

The hubs are available now for US\$70 (desktop) and US\$48 (laptop mini-hub).

—TCP Staff

Palm introduces M125



Hot on the heels of HandSpring's new product announcements, Palm Computing (www.palm.com) unveiled its new Palm M125.

The new handheld offers a faster processor—the ExynosII, V2 33 MHz—than its predecessor in the m500 family, is powered by two AAA batteries. Includes 8 MB of RAM and runs Palm OS 4.0.

The M125 comes with a USB cradle for syncing data to a PC or Mac. The software bundle includes Entourage Documents, To Go 6.0, PocketMail 3.0.2, Palm Reader 1.0 and the Palm Pilot Connectivity Kit. It features an expansion slot that accepts MultiMediaCard (MMC) and Secure Digital (SD) cards for adding content, memory, and applications.

The Palm M125 has an estimated street price of US\$248.

Palm also introduced several new expansion cards, including the PalmPilot Language Translator Card, and three PalmPilot eBook Series cards. They range in price from US\$29.95 to US\$39.99.

—TCP Staff

Pocket Acrobat Reader beta available

Adobe Systems has released a public beta version of Acrobat Reader for Pocket PC. The product, which will allow users of Pocket PC-based handhelds to view content in PDF format, can be downloaded for free at http://www.adobe.com/products/acrobat/cpcc_beta.html.

Compatible devices include the Hewlett-Packard Jornada 520 and 540, Compaq iPaq (H4400, H4405, H4410, and H4415), and Casio Caspeera (E 125, E4600 and E 125) handhelds. Adobe released Acrobat Reader for Palm OS earlier this year. Downloads of that application have already topped one million, according to Adobe.

The Pocket PC Reader allows users to read, navigate, and search PDF documents to their original format as well as to fit the handheld screen.

It is compatible with Windows 9x, ME, NT 4.0, and 2000, and requires Microsoft ActiveSync 3.1 or 3.5, and a Pocket PC device with minimum memory of 16 MB. Initially, it will only be available in English.

—TCP Staff

Neo, Pro join HandSpring lineup

HandSpring (www.handspring.com) has introduced two additions to its vast family of handheld computers: the Pro and Neo.

The Pro has 16 MB of memory, a lithium-ion battery that recharges in the cradle, a client suite with a blinking LED, and a silver casing. The Neo is HandSpring's new entry-level model. It has 8 MB of memory, runs on two AAA alkaline batteries, and is available in either red, or blue. Both new models feature a four-bit grayscale monochrome screen, a Qualcomm V2 processor, Springboard expansion slot, and all the basic features of the Pro line of products.

The Pro is available for US\$299, and the Neo for US\$199.

In addition to the new PDA, HandSpring announced it has added a HandSpring-branded version of iDAD's eye-molded digital camera to its line of



Springboard modules. The camera has full VGA imaging capabilities and can capture short video clips that can either be viewed or downloaded to a desktop PC. It's available for US\$159.



Freeplay helps Motorola wind up phones

Freeplay Energy Group (www.freeplay.net) and Motorola (www.motorola.com) have announced an agreement to develop, co-brand, and distribute a Freeplay-driven wireless phone power source. The wind-up accessory, which is compatible with a variety of Motorola and other wireless phones, is expected to provide between three and six minutes of talk and several hours of standby time for each 45 seconds of hand-cranking.

Freeplay already manufactures and sells a line of wind-up radios and lanterns.

The new self-sufficient power source for mobile phones is expected to become available in U.S. by the end of the year.

"A wireless phone user, using the new accessory, will never again be faced with a situation where he or she can't make a critical call because their battery is dead and they have no access to an outlet. And in an urgent situation, that's an incredibly reassuring and powerful advantage," says Gary Russell, a business director with Motorola's Personal Communications Sector.

—TCP Staff



Microsoft releases wireless optical mouse

Microsoft (www.microsoft.com) has announced the addition of a wireless optical mouse to its lineup of desktop peripherals.

The Wireless IntelliMouse Explorer, sports a redesigned grip support, finger grooves, silver shell and glowing red underside, and can be used in either hand. It is powered by two AA batteries, and operates on standard radio frequency communicating with a receiver that can be placed up to 10 ft (3 ft.) away and out of line of sight.

Microsoft says the mouse employs power-saving technology that extends battery life. The mouse can sense the presence of a hand, which then engages the optical technology. When the hand is removed, the mouse turns itself off, preventing it from being able to conserve battery power. It also drops to low power mode when lifted off a surface.

The mouse uses IntelliPoint software which Microsoft says now offers faster wheel scrolling, program-specific button assignments, and the ability to reset keystrokes. As well, the wireless mouse—along with its wired siblings, the IntelliMouse Explorer and IntelliMouse Optical—incorporates new IntelliSense optical technology, which Microsoft says offers smooth cursor control on virtually any surface. All of the IntelliMouse products are Mac and PC compatible.

The Wireless IntelliMouse Explorer has an estimated retail price of \$104.95 and \$84.95, respectively. The IntelliMouse Optical has an estimated retail price of \$64.95 (CAN).

—TCP Staff



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Napster strikes deal with music publishers

NEW YORK—Embattled music-swapping service Napster (www.napster.com) took a first step toward getting back in business with the music industry, on late September, as it announced a landmark settlement of the latest class-action settlement filed nearly two years ago by a group of U.S. music publishers and songwriters.

In a deal headed by one music-publishing executive as a "landmark decision," Napster has agreed to pay publishers and songwriters US\$30 million for past unauthorized trading of songs over its file-sharing network, while paying music publishers US\$400 million in advance against future royalties.

The deal will give Napster access to between 400,000 and 700,000 published songs, including the recording industry—which also owns copyrights on all these songs—reaches a similar agreement at some point.

The settlement, the first since then, lets digital subscription service supply payments to songwriters and publishers based on provisions of the federal Audio Home Recording Act (AHRA), which directs portions of money collected through the sale of blank tapes and recording hardware to the music industry in compensation for royalties lost where consumers make their own copies of recordings.

The deal was announced at a press conference in New York by Napster chief executive, Kessel Hillman, National Music Publishers Association (NMPA) chief executive, Edward F. Murphy, and Cary L. Chapin, president and chief executive of the Harry Fox Agency, HFA's licensing arm.

The firm agency would license songs, monitor copyright compliance and collect and distribute royalties from Napster under the agreement.

"It's a very important day for me, for songwriters and publishers," Murphy said at the news conference. "We have much to be thankful for where you consider all of the problems that we had in reaching this particular agreement. I think we've overcome most of all of these obstacles."

Under the deal's terms, Hillman said, Napster will pay songwriters and publishers

one-third of an unspecified portion of its future subscription revenues. If Napster settles with the recording industry, Hillman said, it will pay them two-thirds of the same unspecified sum.

The deal is important, though it is a somewhat less important arrangement than it sounds on its face, according to Aram Sarachik, a Napster lawsuits commentator.

"What Napster is not doing is allowing one-third of their consumer revenues to music publishers," Sarachik said. "What they're doing is they're taking an unspecified portion of their revenues and they're allocating that to all the costs of content, royalties and licensing."

From that pool of money he said, Napster will pay one-third to publishers. "That is very similar to the deal that exists for other digital content in the AHRA," he said.

Despite today's tentative settlement, the legal battle between the pay to peer (P2P) file-sharing service and the music world labels remains unresolved. "We are in pain with them," Hillman said. "They are not backing off just."

Napster has agreed to pay publishers and songwriters US\$30 million for past unauthorized trading of songs over its file-sharing network, while paying music publishers US\$400 million in advance against future royalties.

However, he said, Recording Industry Association of America (RIAA) president Hilary Shorn has concluded that she wants to settle the labels' case with Napster.

Napster previously reached settlements with groups representing more than 150 independent record labels in the U.S. and Europe as well as with rock acts Metallica and Dr. Dre.

"We are interested in making everyone happy in this market," Hillman said.

The pact will not go into effect unless it is approved by U.S. District Court Judge Marilyn Hall Patel, various individual publishers and songwriters represented on the class action, and the NMPA board of directors. However, RIAA's Murphy and those opponents "should be a busy race to court."

"We've very hoped that all the publishers who [this proposal] will go over to will opt out [it] and become participants, and even what we hope will be a great American experiment to not see this case actually will work," Murphy said.

As P2P went to press, Hillman had given no details about when Napster was expected to roll out its new subscription service. Napster had been out of service since mid-summer, when it closed down temporarily to improve its digital fingerprinting technology, put in place in an effort to block the digital transfer of copyrighted songs over its network. Judge Patel ordered Napster to remain out of service shortly afterward, and while appeals judges overturned her decision and ruled Napster could go on operating pending the outcome of the copyright infringement suits in fact, Napster nonetheless never went back online.

Hillman said in early August that when Napster returns as a paid service, it will change about US\$4 a month for a basic subscription. Many analysts, including *Forbes*, expect Napster will actually offer two tiers of service, much like those offered by cable television operators, with premium services offered to those willing to pay more.

On the announcement of the deal in late September Hillman was less specific about pricing. "We're still working on the ultimate group model," he said. "It is going to be a consumer offering that we see very connected with service in the marketplace." He added that the service will improve "later this year."

Analyst Sarachik said the agreement may be most important item that he called "a political statement."

Music publishers, he said, were keen to get on board all the market so they can play a role in determining the amount of money they

will receive when the recording industry rolls out competing digital music subscription services. "It's very important for them to get some kind of publisher-friendly precedent in court making before they ask for deals with the likes of Time Warner and Microsoft," Sarachik said.

"From Napster's perspective, I think it's very important that they have something that indicates they're moving forward with a commercial service, and that that service can not certainly be argued in the future of MusicNet, with which they're making a preliminary deal," he said.

There is little question that Napster faces an uphill struggle not unlike its move toward becoming a regulated, legitimate business.

According to a recent report from *Web.com*, the digit of entertainment assets firm, P2P file sharing has come back with a vengeance since Napster went offline, as fans have taken to using substitute sites like Lime, Limewire, and MusicShare. P2P users have now surpassed the levels reached in February when Napster was at the peak of its popularity, *Web.com* reported.

Questions about how Napster at the news conference announcing the deal indicated that concerns, as some reporters asked if Napster may have lost too much momentum to attract new users since pulling its own plug. One reporter asked the company to clarify its stance on the fact of its compliance on both the law and paid side of the marketplace. "I wonder if you can agree with the world should still care what Napster says to a reporter from the MTV Interactive news outlet."

"I'm convinced of the power of the Napster brand name," Hillman responded. "We convinced that people will come back and check out what Napster has to offer next."

If it has gained nothing else, Sarachik said, with the announcement, Napster a growing headlines, which, after a long period of relative obscurity, has proven more recently.

"One could point the fact copyright space is going to be the main benefit that Napster reap from this announcement," Sarachik said.

—Newshyber

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The evolution of computing

If the PC is dead, what new crop of digital devices is waiting in the wings?

By Jeff Jensen

The main virtue of the standalone PC—the ability for the user to choose whatever hardware configuration, software, and peripherals he or she wants, and to work either connected to a network or not—may become less attractive when pervasive neural and wireless networks are widely available, offering a rich array of services to non-PC users.

When surveys of personal computer use are done in Germany, a fairly small set of activities account for most users' time. These core activities include e-mail, Internet access and Web browsing, word processing and office productivity, games, and education.

As well, there is a grab bag of "other" applications that all have user communities of various sizes: graphics, MP3/music, digital photography, programming, software and data storage, chat, instant messaging, Internet phone, digital video, and speech recognition.

The desktop PC has evolved to extend, by support of these activities, involving many different media, user interfaces, software programs, input and output devices, and networking options.

Even an entry-level \$800 desktop or \$2,000 laptop PC is remarkably flexible in its ability to handle the broad range of core computing tasks, and with a bit of effort, take on as many of the other categories as user wants.

Is there any other single device that lets us do all these things? The answer is, no. Rather, there is a host of devices and services that will do some of the things the PC can do, but not all.

What other devices do at least some of the many jobs that the PC can do today don't let's go down the list of most common computing functions and see if there's anything beyond the easiness.

Final

At first glance, there are lots of good non-PC alternatives for reading and receiving e-mail. On the mobile wireless side of the



equation, for example, we have been huge fans of IBM's BlackBerry Internet Edition since its appearance nearly two years ago: the tiny wireless computer really does make handheld wireless e-mail and text browsing simple.

However, even the BlackBerry is not

nearly as efficient or productive at handling e-mail as a PC. The BlackBerry's screen is tiny, showing only a few short lines of text at a time.

It can't show much in the way of graphics, and is completely incapable of show-

Continued on page 22

And you thought your PC was hot

What will you do with 10,000 times the computational power you have today? This is one of the intriguing prospects raised during a presentation by John Kerdia, a distinguished engineer with IBM's personal computing division. Among Kerdia's achievements with IBM are the member of the Transcend computer, which was introduced earlier this year, and the upcoming TouchPad keyboard, better known as the "hot-to-fly" introduced on the ThinkPad T61 in 2005.

In reflecting on the course of personal computer development since the birth of the IBM PC in 1981 up to today's Notebook A20, Kerdia said we have seen processor power increase by 380 times, memory capacity grow 8,000 times, and storage capacity 500,000 times.

Most PC enthusiasts have heard of Moore's Law, which predicts that the number of transistors on an integrated circuit will double every 18 months. First stated by Intel pioneer Gordon Moore in 1965, it remains an accurate prediction today.

But as Kerdia pointed out, other subsectors that make up a personal computer are growing as fast, if not faster. For example, storage density is doubling every 12 months, while energy efficiency is increasing dramatically. In short, using a simple linear projection, 25 years from now we might expect computational power to be 10,000 times what it is today. We would have 3,000 times more processing power per unit of energy consumed, and hard drives would have 25,000 times their current capacity.

But of course, product evolution does not necessarily occur on a linear path, so predicting the exact nature of future products is a tougher game. A couple of concept products IBM had on display during the presentation were a CyberPhone and a Linux-powered wristwatch PC.

The CyberPhone prototype incorporates a virtual display comprising a projection system and a flip-out curved mirror. The mirror, which acts as a screen, can be swung out and viewed while using the phone. The optical arrangement allows the viewer to look at the tiny screen, but see

a magnified virtual display, equal in size and detail to a full-size computer screen.

The wristwatch PC still has a ways to go to reach commercialization, and the prototype that was on display while trying by PC standards, was bulky by wristwatch standards. But IBM officials said there are no physical limitations (the limitations at this point are in the fabrication and manufacturing) to prevent a wristwatch PC from being reduced to the volume of a dress watch. Using high-resolution screen technology that IBM has already developed, the display on the wristwatch PC could be as readable as anything printed on a standard watch face today.

If these prototypes reach commercial feasibility, IBM will likely enter manufacturing partnerships with other companies, rather than entering the phone or watch business itself.

—David Sencer

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The evolution of computing:

Customard from page 20
ing a regular online Web page. Writing
email on the BlackBerry is a curious exer-
cise, typically performed by holding the
device in both hands and typing on its
two keyboards with both thumbs.

You can usually tell when you are getting an email message from a BlackBerry user: the messages are extremely short, and often show unusual punctuation and capitalization of words.

The BlackBerry's shortcomings are compensated for by its virtues, but it is still heated.

You can usually tell when you are getting an email message from a BlackBerry user: the messages are extremely short, and often show unusual punctuation and capitalization of words.

The latest generation of digital cell phones includes models that are fully capable about numerous medical devices.

The latest Savers change introduced by

Yelus features a large, detailed colour screen that supports Web browsing and email.

However, due to the lack of wireless data standards, we found that we often moved out of the service area for this phone, or simply spent a long time waiting.

With a wireless modem and a fold-out keyboard, the latest generation colorist PocketPC devices (such as the Compaq iPaq, which we have tried), and properly equipped Palm devices, are much more suitable for reading and writing email.

However, again due to the lack of digital wireless data standards and the slow speed of wireless data services, they are far less productive than a PC with either a dial-up or high-speed cable (DSL) service.

They are also not cheap: \$450 to \$750 for the handset, \$120 for the keyboard, \$200 to \$350 for a wireless modem, plus software, plus a slow wireless data service. Your first year with a Palm or iFrog wireless solution could set you back more than \$1,500, including taxes and wireless service charges.

That is the cost of a decent PC and high-speed Internet service.

In terms of stationary, wired e-mail alternatives to the PC, set-top boxes, such as WebTV and even video game consoles, have occasionally offered e-mail features.

Flowers, then, also require a herbivore.

and a mouse, just like a PC, and few users enjoy the experience of reading and writing email on a widescreen TV screen.

In general, most people prefer computing on a computer and using the TV set to watch programs or play video games.

Conclusion: For email, there are wireless, handheld solutions that will work well enough for many of us, but they are expensive.

An iFlag with a wireless modem costs as much as an entry-level PC, plus anywhere from \$40 to \$75 per month for slow, sometimes unreliable, Internet access.

While PC users seem to be hanging onto their old computer longer (part of the reason for the downturn in PC sales is that end users find even a two- or three-year old PC is fine for most common computing tasks), handheld wireless users are buffeted by waves of obsolescence every few months.

Current handheld computing solutions are based on rapidly shifting and quickly obsolete hardware, software, and wireless infrastructure.

The risk of being orphaned if your service provider goes bust was demonstrated recently when the US-based EudorNet high-speed wireless service went bankrupt, leaving thousands of subscribers with extremely expensive wireless modems that no longer connected to any

Change

And finally, although I know many Palm, BlackBerry, and PDA users who are devoted to the portable convenience of their handhelds, after spending an hour or two per day fiddling with handheld scroll wheels or buttons, squinting at tiny screens and tapping on tiny keyboards, losing wireless connections and batteries come dead, the PC doesn't look so bad.

Internet access and Web browser

For full access to the multimedia content of the World Wide Web, a high resolution colour display (at least 600x600 pixels, and 16 bit, 65,000 colour display capable) and reasonable access speed (at least 36 Kbps) is necessary: most of the rich Web is designed with these conditions as the minimums.

As we reported last month (see "Battle of the Internet Boxes" in the October issue of PCP), high-speed service providers Bell Canada and Rogers each have their own plans to offer a Web access solution that would eliminate the need for a PC. In the case of Bell's CombiBox, we relegate it to the status of just another device, alongside the TV, stereo, etc. (in the case of Rogers' Trade Box).

These will be available some time in 2003, but will likely take at least a year to

Continued on page 24

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Schools battling Internet plagiarism

LOS ANGELES—Is a student desperate to get a good grade, the Internet is not merely a source of research information, it is "a 15 billion-page searchable, cut and pasteable encyclopedia."

That is the message from John Barrie, the developer of software used to catch online plagiarists. Barrie, who earned a doctorate in lexicography at the University of California at Berkeley, said students today are cheating as necessary for keeping up with fellow students in pursuit of academic goals.

"There are three factors that make cheating more prevalent today. The first is the unprecedented amount of information available on the Internet," said Barrie.

"The second is, it is hard to catch people doing it. Third, there is such a competitive environment these days."

Students, and even parents in some cases, figure the risk justifies the means, he said. The theory is, if one has to cheat to get into a prestigious high school, university or professional school, the important thing is to get there.

"There is a lot of 'everybody's doing it, so even if you catch me, don't make an example out of me' attitude today," stressed Barrie. "You see it in doctors, law students, everyone."

Plagiarism strikes back at Barrie's assertions. A survey by the Center for Academic Integrity in the US found that

almost 80 percent of college students admit cheating at least once. A study by US News and World Report found 99 percent of students believe cheaters either are never caught or never have been appropriately punished.

Surveys conducted by Barrie's company discovered 58 percent of UC Berkeley students were plagiarizing directly from the Internet.

Barrie and he "assembled" into the field of anti-plagiarism software. "I had an intention of becoming a consultant for ethics," he joked. In college he studied how the brain encodes the sensory environment, or what we see, hear and smell, and how it stores information—memory and perception.

"It is quite a stretch to go from that to anti-plagiarism software," he said.

In the 1994-95 academic year, Barrie was a teaching assistant at UC Berkeley. He thought it would be "cool" to let students read other students' term papers. His hope—professional academics are all about peer review, but 99 percent of university students get no practice in reading and critiquing other students' papers.

Barrie posted his students' papers to a class Web site, with authors' names stripped, and requested each person to read at least two other papers and post anonymous review online. He wrote an article about the process for a Science magazine study in 1996. "It was about how the World Wide Web would extend the model of education in the future," he recalled.

A study by US News and World Report found 90 percent of students believe cheaters either are never caught or never have been appropriately punished.

The editors at Science noted that Barrie's article discussed only the positive effects the Internet might have on the future of education, so they asked him to predict some negative scenarios. He came up with two: if students put information on the Web, someone might take it, and if a professor accepts work from a student, he might be fired from that person.

"In 1997, I was doing a follow up to my study, and I read headlines of articles about digital cheating and how widespread it was. No one had a solution to the problem," he said.

The next year, Barrie founded Turnitin.com (www.turnitin.com), a company that purports to compare student papers not only to material available on the

Internet, but also to a database of collected papers, literary works and other sources.

"The way it works is, an institution, which could be a high school, college or university, licenses the service. The professor tells the students to turn in a paper version of their paper to them, and a digital version of the paper to the professor's account with Turnitin.com," explained Barrie.

The company then checks the contents of the paper against its database by paragraph and even sentence, he said. The professor then gets an annotated version of the paper, and if any portion looks like it came from another source, it is color coded and marked with either the address of the Web page where it came from, or the name of the book, if applicable.

"If a thousand student plagiarists from a Stanford student's papers, we give the Harvard professor information about the Stanford student's instructor, including the e-mail address so they can contact," said Barrie. "It works the same way for high school papers. It is like one teacher can walk across the hall and ask another teacher if a student turned in the same paper for two different classes."

Turnitin.com claims a largely list of big name schools throughout the U.S., including Georgetown, Duke, Villanova, Rutgers, and the U.S. Military Academy, West Point. Even outside the U.S. include the University of Western Ontario, the University of Leeds in the U.K., and the Marquette Institute of Technology in New Zealand.

According to Barrie, Turnitin.com has 35,000 registered clients around the world, including 25 percent of the community colleges in California.

One school that will rule the Turnitin.com software available to all faculty members on its campus starting this fall is the University of California at Los Angeles (UCLA).


John Sandbrook, the assistant provost for UCLA's College of Letters and Science—which includes 800 faculty members, 3,000 graduate students, and 28,000 undergraduates—said the departments of chemistry and biochemistry began using the software last winter semester. He said the faculty members who used it were quite laudatory.

"It was not part of a master plan, but the chemistry department served as a beta test. Sometimes that is the best way," said Sandbrook. "Unfortunately, they had a couple of cases of plagiarists they had to report to the dean of academic ethics."


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Schools battling internet plagiarism
Continued from page 20

Sandbrook said he prepared a notice to students regarding the software that was in the *Daily News*, the campus newspaper. The school already uses an "electronic gradebook" that allows professors to sub-

mit grades electronically to the registrar's office, rather than use paper. Students then can check their grades online in a secure fashion through the UCLA portal page, said Sandbrook.

"I want to kill two birds with one stone by giving notice of the gradebook and the

new service," he said.

Sandbrook explained that the school will be careful about using the term "plagiarism service."

"The service does not make a value judgment. It does a search and provides a report to the faculty member that says the

paper is 10 percent, 30 percent, or 80 percent duplicate of what is out there. Hopefully, it will say all papers are zero percent duplicative, but if there is duplicative text, it is up to the faculty member to decide if it is plagiarism. If so, then they refer it to the dean of students."

Sandbrook does not expect every faculty member on campus to use it, but he said there has been a lot of interest. The software will be available not only for all undergraduate departments, but also to the UCLA School of Law and the Anderson Graduate School of Management.

"Hopefully, we won't catch people because it will be a deterrent," said Sandbrook.

Steven Hordings, a lecturer with the department of chemistry and biochemistry, echoed Sandbrook's sentiments about the deterrent effect of the software.

"This is where it is most useful. It tells the students we are watching, and we have a tool to catch plagiarists," said Hordings, who used the Turnitin.com software in his classes during the winter and spring quarters. "It also demonstrates the university has a clearly stated public policy on academic dishonesty. A combination of the deterrent and the stated penalty is effective."

According to Hordings, student response was not positive, but it was not negative, either. "It's not like they are saying, 'thank you for watching me,'" he said.

Hordings said the software definitely served its purpose, and detected several instances of plagiarism that may or may not have been caught otherwise.

"One was so blatant, we would have caught it regardless. The student copied an entire Web site into a document and submitted it as a paper. It was done so poorly, it still had links on it, which showed up in blue on the printed version," he said.

Hordings praised the Turnitin.com service as being easy to use both for him and the students. He said, when it came time for students to submit papers, he simply told them to turn it in to the Web site, and explained the purpose of the site is to look for plagiarism. When it comes to cheating, Hordings says he does not spend as much giving a lecture on ethics, he simply tells his students not to do it because it is not worth the penalty.

"If a case of academic dishonesty is reported to the dean of students, just about anything can happen, up to expulsion from the university. Even if you are suspended for just one quarter, if an appointing physician has a record of academic dishonesty on his or her transcripts, that might be the end of a career. No legitimate medical school will take someone who cheated."

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Ever since Diamond introduced the Rio player, MP3 audio has captured our attention like few other things from the world of computing. TCP Lab looks at what's happening at the crossroads of computers and music



By Sean Carruthers

While the music industry wrings its hands and protests that digital copying and swapping of music will kill the industry, the phenomenon has brought more music to the attention of more people than ever before. In short, people are making digital music a bigger and bigger part of their lives.

Of course, it's not as easy as just downloading. "I'm going to join the world of digital audio today." You still can't take your player down to the mall and download your favorite new songs at a kiosk, for example. Downloading music and loading your player is still largely a computer-centric activity.

Thus, whether you burn your own music or go searching online for tracks to listen to, you'll need a personal computer. If you want to

Continued on page 16

Office suite
slugfest:
Part 2

Top four apps
in Office XP and
WordPerfect Office
2002 face off

By Jacques Surveyn

Having looked last month at the common features of the suites with special attention paid to integrations, Web support and collaboration, it is now time to focus in on the main programs in the suites.

Word versus WordPerfect

Settings Word Perfect 2002

Word 2002

Microsoft Word and Corel WordPerfect interfaces look similar and, as it turns out, on careful examination, are substantially equivalent in functionality but about anything you can do in one you can do in the other. Just as the two programs mirror each other's strengths, they unfortunately mirror the same weaknesses.

If I had a major document or book to write with extensive footnotes, endnotes, tables, equations, lists of references, table of contents, indexes, and other text-based requirements, I would be absolutely confident that both Word and WordPerfect would be able to handle 50 to 500 hundred pages with equal aplomb.

However, the more you want to create documents with mixed elements—graphics, charts and text that are not within the main document flow—the more headaches you can expect to encounter from both programs.

For example, placing images or text boxes is usually simple, but once changes have to be made (for example if a half page of text is added or removed from the document) the effects of these changes on the position of the graphics elements is

Continued on page 37

Paint Shop Pro Anniversary Edition



From Jasc Software Inc.,
www.jasc.com
Street price: \$49.95

Out of the box, Jasc knows the need for expression is crucial, especially with so many images and image covers hands to the latest digital cameras and the Web. Thus, it includes a tool, IntelliTape, a well-written manual and command summary. Summary: This tool will be lighting it out with Adobe Photo Elements and Corel PaintShop Pro. The growing image-aware PC community to advantage is a vibrant tool, IntelliTape, ease of use, and Anniversary Shop and Media Center Plus bundle. Overall rating: A-2

Paint Shop Pro
10 years later

Anniversary edition packed with extras

By Jacques Surveyn

The anniversary edition of Paint Shop Pro is loaded with 300 MB of programmatic and graphics goodies. The package contains not only Paint Shop Pro 7.04 but also Animation Shop 5.0 for creating animated clips and movies and Media Center Plus 3.0 for creating albums from images stored in multiple directories and the folders (Animation Shop and Media Center are available separately for about \$30 each.)

Jasc has also thrown in extras such as sample photos, fonts, textures, shapes,

frames, and effects that make the job of graphics processing that much easier—all almost like the golden CD includes with its creativity software.

Competitive advantage

Paint Shop Pro's competitive advantage is its thumbnail picture browser.

I frequently need to quickly search through all the images in a directory, make a few thumbnails to an image, then copy two or three images over to another directory for use in a Web page or word processing document. To do this with

Continued on page 25



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Paint Shop Pro 10 years later

Continued from page 32

Corel's Easyvase, Adobe Photoshop Elements, or even MG! PhotoSuite is either impossible (nonfunctional browser) or sheer torture (MG! has got to simplify). The only program that comes close is Ultra's Photo Explorer and I use it for creating calendar screen savers, and Web galleries—but that's another review.

The bottom line is that Paint Shop Pro has a fast, easy-to-use, built-in image browser coupled with an increasingly powerful graphics program. For the browser, I always use it to manage my photo sets and the power of the graphics program now has me using it for a lot more of my editing tasks.

The browser deserves full credit, with the copy, move, delete, rename, get info on, and arrange and print multiple copies features making it easy to manage all the images in a folder. For its thumbnail browser alone, Paint Shop Pro is worth the price of admission.

Paint Shop Pro innovations

Some wags would say Paint Shop Pro competes on price and by appropriating the tools perfected by Adobe Photoshop and Corel PhotoPaint. Well, in the software business, imitation of others' ideas and tools is one of the keys to survival.

And lately the big boys are copying. Paint Shop Pro is Photoshop's 6 and the new Photoshop Elements, for example, Adobe is tooling in vector shapes—a feature that Paint Shop Pro has included and continued to polish over version 5.

Paint Shop Pro's library of shapes, and its ability to move, scale, rotate, and have them interact with bitmap images has caused a recent wave of imitations, including Deluxe Canvas 4 and Ulead Photo Impact.

Paint Shop Pro is not resting on its laurels. It has extended shape processing by adding the ability to apply styles and arrange shape layers, thus bringing the benefits of precise vector drawing and scaling to bitmap photos cranking on an effective way.

In addition, no other graphics vendor has seen fit to include a stimulus screen capture tool as convenient as the one embedded in Paint Shop Pro. Finally, Paint Shop Pro is now accounting to the use of printing options, allowing multiple images and output to the Web, combining three in clever ways to reward the user's output choices.

At the same time, the basic graphics processing features of Paint Shop Pro have notable improvements in colour processing, layers and objects, and layer windows. However, a big gap still remains between Paint Shop Pro and top-of-the-line products like Adobe Photoshop and Corel PhotoPaint.

In colour processing, for example, Paint Shop Pro has largely matched Adobe Photoshop's 8-bit channels, Contrast, Color Balance, Channel Mixer, and Tone Curves tools, but with the notable absence of colour sampler tools. It is these colour sampler tools that allow for precise control in Tone Curves, Sample/Target Balance, Contrast Enhancement, and Replace Colors dialogues in Photoshop and PhotoPaint.

In addition, both Adobe and Corel support more colour types, and it's hard for Paint Shop Pro to match the convenience and handy Corel colour tools like Brightness/Contrast/Intensity, Color Tone and Color Hue dialogues with three previous modes.

Likewise in the arena of layers, Paint Shop Pro has made great advances, now offering vector layers, new types of adjustment layers, and greater blend control between the layers. But again Adobe and Corel stay two steps ahead with many more adjustment layer types and—in the case of Adobe, much more precise inter-layer transparency and grouping effects.

In the arena of masking, too, Adobe is edging, painting, and blending expert. Paint Shop Pro has a long way to go to match the power and ease of both Photoshop and PhotoPaint.

So Paint Shop Pro can't compete with other top-of-the-line image processing programs in specific areas, but the improvements in effects, brushes, layers, and colour control are more than enough to give the product a great price/performance advantage for the legion of digital artists. Web graphics and business illustrations who need a robust and versatile tool for image finishing.

These men don't have the time to coast up to speed with all the bells and whistles of top-of-the-line image processors, but Paint Shop Pro's many rewards, tutorials, and balanced set of tools will make for a useful and very approachable graphics program.

Animation Shop

Animation Shop is to Paint Shop Pro what ImageReady is to Photoshop. Animation Shop is devoted to producing GIF and other animations for the Web. Since I use power Microsoft AVI movie files and Autodesk FLC files, but those are really only practical for short animated inserts and captions, not for vibrant editing.

For GIF animations, Animation Shop really shines by offering handy tools for loading, editing, and enhancing animations, especially with strong transition tools and special effects.

However, unlike ImageReady, Animation Shop has few loading, brush, colour touch-up and text editing tools. Users will find that they'll be using Animation Shop in conjunction with

Paint Shop Pro and other graphics tools. Animation Shop also lacks the ability to output in Flash SWF file format. However, for doing simple, effective GIF animations, it is a handy tool.

Media Center Plus

Media Center Plus is Intel's photo client software. I recommend you say, because Paint Shop Pro already has a built-in thumbnail browser. Well yes, but Media Center Plus has several features that make it very useful to its own right.

First, an album can span several directories and folders. Second, users can choose which images to load from folders either manually or by expression (all JPEG files, or all BMP files, for example). Third, Media Center Plus loads the images even faster than Paint Shop Pro's browser, which it is a touch. Fourth, users can add keywords to each image, then search and

sort based on those keywords. Fifth, users can add individual comments to any image as an album, which is very useful when several people are working on a project—a running status report on images can also be maintained. I find that remote handling for recording my exposure and other camera settings for images I have taken.

But the most important feature of album that one can more images can be dragged from Media Center Plus and dropped into just about any program, including Word, WordPerfect, Visual Page, PhotoShop, PhotoPaint, Dreamweaver, and of course, Intel's own Animation Shop and Paint Shop Pro. It is a keeper. □

Jacques Sawyer is a journalist and photographer, currently working on his photo book, *www.photobooks.com*. You can reach him at jsawyer@photobooks.com.

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Continued from page 21

not easily controlled.

Word tends to produce lurching movement when repositioning a graphic, even if the graphic is not attached to a line, paragraph, or page. In some cases, if there was another graphic or text box on the page, it simply could not position the two graphics relative to each other in a satisfactory manner.

In WordPerfect, I occasionally had similar problems, but with text boxes. Even worse, WordPerfect does not allow for overflow from one text box to another linked text box. This can cause havoc when adding material to a window linked to a graphic. Word's ability to link text boxes for overflow is very useful at this situation.

The second problem I encountered with both programs is the strong depen-

dence between what you see onscreen and what you get as either Web output or printed output. Paragraph leaders, columns, drop shadows, line widths, fills, and watermarks simply did not match what was onscreen.

WordPerfect does better than Word, but the bottom line is that output to the Web in both programs (if I set output of WYSIWYG [what you see is what you get]), and PDF output was good, in the case of WordPerfect, which supports PDF output out of the box (Word does not).

Printed output was much more faithful than Web output to HTML, but there were always annoying differences between on-screen and printed output with both products. Word seems to have more rich systems such as borders, table ruling, fills, and drop shadows, while WordPerfect could unleash some real corners in line spacing and justification.

But, with WordPerfect I could always publish to PDF, then get Camtasia or Adobe Acrobat to print the document with unapproved K&L—just in the case of much longer print files.

Both programs support a long list of word processors, spreadsheets, and even database programs for import and export, but after that, programs are classified to programs in their own centers. Both programs have roughly equivalent programmatic connections. Through Visual Basic for Applications (VBA), but for integration with other programs, the advantage goes to Word.

As we progress on in Part 3, WordPerfect Office seems better suited than Microsoft Office XP with a broad and true range of support systems for users, including Perfect Experts, a content-sensitive property bar, right mouse click menus, plus a help system that is check-

full of how-to. The support is more published in WordPerfect. In Word, I am constantly waiting for the Smart Tags to materialize and Task Pans to match my needs. The Perfect Experts is under my direct control.

However, Word's Help question bar on the extreme right of the main menu is a welcome plus—eliminating two steps to getting help. But both vendors could beef up their Help features by allowing for more responses to key topics alone. For example to find out about collaboration features I entered "collaboration," "group," "team," "review," and "workgroup" in both Help systems but only one term in each—"review" in Word and "workgroup" in WordPerfect—produced the relevant help. Users may be justified in feeling that they have to fight to get help.

WordPerfect's Real Reveal Guides and Word's a Real Formatting Task Pane to get users out of serious formatting trouble, but again, WordPerfect's Real Guides proves to be easier to use—WordPerfect is just easier to use when Word.

Among the distinctive features of the two word processors, Word translates text into other languages, has a helpful word count dialog, Smart Tags, a more powerful mail merge wizard, the Clipboard Task Pane, Style and Formatting Task Pane, and Application repair and recovery.

WordPerfect has the word correction synonym pull-down, an annotation point design, a whole new XML Project Designer, and online preview of some formatting and spell changes.

In the balance of things, WordPerfect's support for XML (or has an excellent online tutorial) is probably more significant in the longer term.

Continued on page 38



Corel WordPerfect Office 2002

From: Corel Corp.

www.corel.com

Street price: \$495.240 (suggested)

Out of the box, you install some set of options in Office XP that single rather than multiple installation. Printed manual: Perfect Experts are content ready to getting started. Very easy to use and efficient knowledge of how to use.

Pros: Expansive core tools—WordPerfect, Quattro Pro, Presentations, Corel Paint and Painter—along with rate of use and re-integration with delivery.

Cons: Sell to sell for web page development, extant publishing issues in WordPerfect still exist, more problems, sluggish UI, selection. Overall rating: 3/10

Microsoft Office XP

From: Microsoft

www.microsoft.com

Street price: \$595.99 (suggested)

Out of the box, long but simple install. Be careful on activation. No printed manual, but new Task Pane help.

Pros: Adds new abilities and new but select feature set of office tools. Integrating more strongly with Exchange, Visio, SQL Server and Windows 2000.

Cons: Deal with Task Pane, it is complex to learn and get all benefits, less likely to improve Word core engine, RASAW, and more problems, sluggish UI, adoption price increase. Advantages: Very. Overall rating: 4/10

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Office suite showdown Part 2

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respectably similar in their content and even delivery mechanisms. During my tests, I found both programs were very effective in helping me create slides despite the very different layouts. Both Presentation's Perfect Expert and PowerPoint's Task Panes helped speed up slide creation.

When editing slides, PowerPoint's multi-pane was a bit more helpful, and Presentation's multi tab layout was preferable for creating new slides, but both layouts were very workable overall.

However, I found two common differences between the programs. In Presentation, users can create one or several bulletted lists anywhere on a slide, something that can't be done in PowerPoint. But in PowerPoint, users can create tables and other special shapes, like pyramids, radials, and Venn diagrams, which can only be done in Corel Presentations with file imports or OLE object inserts—both methods being rather awkward.

In general, there are several small differences in how shapes, text, images, and other media elements are imported and used on slides, but as we have seen in the case of word processing and spreadsheets, there are more effective similarities

than differences.

Both programs provide a fairly wide selection of slide templates with a general style of background image, colors, and font size used throughout the presentation. More templates are available on both vendors' Web sites.

In Presentation and PowerPoint, effects are easy to apply to individual objects on a slide, the whole slide, or to all the slides in a presentation. Presentation adds a unique internal timing feature that times each slide or the whole presentation.

Included in both programs are handy graphic toolbars for adding a variety of lines, arrows, and standard shapes with colors, line widths, and lettering controls.

Presentation adds a full-blown printing routine, while both programs have similar simple methods for adding organization charts and business graphics. Users can also import spreadsheet charts and tables in a variety of ways. I already had to go to CorelTime or Visio to create a specific diagram or drawing when preparing presentations, but it was easy to import graphics from those programs when necessary.

In the area of output one again sees some differences. Both products should allow files to be delivered on the network, but Presentation's software,

let Corel package the files in a more compact EXE format (to 35-megabyte presentation file on a 1.44-MB floppy disk), where as a similar PowerPoint show and viewer was more than double the size.

With both programs, a standalone slideshow can contain sounds and fonts that may not be on the display machine.

As output to the Web, PowerPoint used to have the lead with its ability to create professional-looking shows based on themes and templates, but Presentation topped that with an Internet Publisher that has four major styles, including the PowerPoint frame style, thumbnails, multi-page web buttons for navigating, and a large single-page view that ties anchors to navigate. Internet Publisher is very helpful in getting the exact look and style for an online slideshow—top marks here for Corel.

As well, Presentation users can publish PDF files. PowerPoint offers the ability to publish to Exchange, SharePoint Services, and Online Meetings, but for my money I'll take Internet Publisher any day.

Delivering the mail

Items: Corel Email 6.1.0

Cost: \$19.95

Corel did not offer a mail client in its office suite (ask WordPerfect Office 3.0). Corel Mail's layout and functionality will

look familiar to users of Microsoft Outlook or Outlook Express, but doesn't have the same bells and whistles.

Outlook shows the perks of many years of development, with extras such as easily assigned mail groups, a calendar of mail items, more event and task options, and more extra small account options.

Corel Mail at least supports a full range of mail standards, including POP3, IMAP4, SMTP, and LDAP for full posting privileges, MAINT, HTML, and SOMEIME for formatting and securing mail contents, plus iCalendar and vCalendar for exchanging lists quickly and securely. It is a very workable mail client, but it lacks the functional appointments available in Outlook Express, let alone the full version of Outlook.

Corel Central nicely integrates calendar, day planner, and address book functions into its mail client, but again, Outlook has more scheduling and calendaring convenience.

Perhaps of even more importance, Outlook has moved into another realm, beyond being the communication center for Office XP.

Users can schedule online meetings, make instant messenger connections, and launch SharePoint Team Services. Outlook has become the portal tool into Office XP with its digital dashboard con-



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Aggression capabilities

The Outlook client has a very available option. Users can configure and size windows that connect to internal files, internet resources, and/or external Web pages and services. In effect, each user can customize access to critical information sources using the digital dashboard. Currently, Corel Control only has limits of this capability.

As good as Outlook is in setting and and other information to users, you can't ignore the fact that it has been the weak link in many malware attacks in the last year. In Office XP, Microsoft has tried to correct the defects, but a lot of security still depends on system administrators monitoring Exchange and Outlook properly and keeping up to date with the steady stream of fixes required to stay one step ahead of the hackers.

Corel Mail does not have a track record yet, but as an alternate to macros, it has Quick View Plus, which can display many different filetypes without resulting to macros or special program viewers (presumably Quick View Plus has appropriate security measures). However, there is another problem associated with both Corel Control and Outlook.

There was the only module to crash during our testing—both crashed three times with Corel Control managing to

Teen hacker gets eight months for DDoS attacks

MONTREAL—A Canadian teen whose hacking efforts landed a handful of popular Web sites offline for hours at a little early last year has been sentenced to eight months in a youth detention centre.

The 17-year-old, who can't be named under the provisions of the Young Offenders Act, has been known as Hefseyboy, according to subscribers, who say he launched distributed denial-of-service (DDoS) attacks that incapacitated Web sites in February 2000.

In January, the Montreal teen pleaded guilty to nearly 80 charges of mischief resulting from the attacks on sites that included Amazon.com, CNN.com, Yahoo.com, eBay.com, and the Web home of computer maker Dell.

During the sentencing in early September, Quebec Youth Court Judge Gilles Gauthier said Hefseyboy would have to spend time in a detention centre, followed by a year's probation. The maximum sentence could have been two years of detention.

Until the end of his probation, the teen is also prohibited from associating with hacker/hacker groups or visiting Web

sites, chat rooms, or message boards related to those topics. If he does get back on the Internet again, he will have to tell the RCMP which ISP he is using.

Hefseyboy was charged by the RCMP in April 2000 after an investigation initially launched in the U.S. by the FBI.

Authorities and Hefseyboy broke into computers on more than 50 networks, around the world—many operated by universities—in order to install and launch automated DDoS software known as Sinkhole. Hefseyboy then directed the remote-controlled software to bombard the targeted Web servers with so many requests they often buckled under the load.

One site, that of online audiobook eBay, was offline for as long as 20 hours under Hefseyboy's attacks.

The many charges against Hefseyboy stemmed largely from the individual, break-ins of computers considered as Sinkhole "bombers."

In court, Hefseyboy was also fined \$200 for failing to comply fully with conditions of his release while awaiting sentencing.

—Wendy Lee

ling down Windows 2000. All of the other Corel and Microsoft programs performed flawlessly.

Corel Control includes a couple of nice extras. NetPhone, which allows PC to phone calls for free (obviate what you already pay to an ISP) in North America,

PC to PC phone calls for free worldwide, and PC to Fax services for a nominal charge.

Bottom line: Corel's mail and communications services are nicely polished and it offers new flexibility with its digital dashboard configuration capabilities.

I (some programming required) □

Next month: In the concluding installment we look at the relational database modules, and offer some opinions on the future of office suites. Jacques Savoyeur is a consultant and writer. He can be reached at j.savoyeur@sympatico.ca.



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Continued from page 32

download all your music, you'll want to get a broadband connection to the Internet—either DSL or cable—or it'll take you a day to download an hour's worth of music.

If you want to use music you already own, your PC will need a reasonably fast CD or DVD drive and enough horsepower to convert your audio into a digital format. Generally speaking, a PC with a 500 MHz or faster processor and 128 MB of RAM will do the job. You should still be able to do it with a machine with fewer specs, but it'll take a lot longer. And of course, you'll need a sound card so your PC, if audio isn't built right into the motherboard.

If you're planning to take your songs on the road, it's important to make sure you have a way to get the audio from your PC to your digital audio device. For the most part, these devices require a USB connection to transfer audio to the portable player, so you'll have to make sure your computer has at least one free USB port.

If you don't think your machine has drive ports, you can often buy an add-in card for your PC, but you should check with someone who can evaluate your system's USB status if you're unsure—most PCs sold in the last couple of years have

USB onboard.

The MP3-CD device is a relatively new development—a portable CD player that also plays MP3 format music recorded onto a CD. If you get one of these portable players, it goes without saying that you'll need to have access to a CD recorder. Most PCs sold in the last couple of years should be able to accept a CD recorder.

For the last few years, a few reasonably new and interesting products aimed at people interested in digital audio. We've split them into sections, by function.

Audio cards

If you want to use your PC as a digital music hub, you can rely on the Internet for audio downloads, or your CD-ROM drive for ripping files to MP3, but sometimes it's nice to have an audio card that will allow you to use other sources for getting audio in and out of your PC. There are a number of high-end audio cards available for professional applications, but thankfully there are also some high-quality cards that are more affordable.

Sound Blaster Audigy Platinum/ Sound Blaster Audigy Platinum EX

From Creative Labs

www.creative.com

Suggested retail price: \$90/\$100



Creative Labs is one of the pioneers of PC audio. It introduced the original Sound Blaster in 1989 and went on to become synonymous with PC sound, with every one else lining up to be Sound Blaster-compatible.

The latest Blaster has come a long way since then, with one of the high points being 1998's Sound Blaster Live!, a card that introduced 3D "environmental" audio to the masses.

The new Sound Blaster Audigy line builds on the success of the Live! card, but improves the specs. The Audigy features 24-bit digital-to-analog conversion with 96 kHz digital input and output, putting it on par with many professional audio cards.

The Audigy boosts the signal to noise ratio to 100 dB, with only 0.004 percent THD (total harmonic distortion). The card has a 32-bit effects engine for four times the processing power of the Live!, and is capable of 64 channel audio mixing. In addition to six-channel output (24-bit/96 kHz in all channels), it can handle up to four simultaneous audio inputs.

What does this really mean? Well, the Live!'s claim to fame was environmental audio, or 3D positional sound, but the card was limited to one effect at one time.

Now, the Audigy can deliver up to four different environmental effects in a single audio "scene" (for example, tunnel sound in front of you, water open canyon behind you, with two other positional sounds elsewhere). The new EAX Advanced HD extension also delivers audio panning, reflections filtering and coupling for interaction to maximize between the speakers. As before, the cards are Dolby 5.1 capable.

There are four cards available in the Audigy line, all of which add at least one ProWare port to your computer, without requiring an extra I/O. We looked at the two cards in the Platinum series for this list, because they are more oriented towards convergence with other audio and multimedia equipment, but the line also includes the Audigy MP3+ (SIS), bundled with audio-related software, and the Audigy Game (SIS), bundled with game-related software.

The Audigy Platinum is similar to the Live! Platinum, with the card connected externally to an audio control panel that sits in a free-form-fitting full-size bay (like a CD-ROM drive). The panel features SPDIF input, optical input, stereo RCA output, MIDI input (midi-play format), headphone jack, microphone jack, a second FireWire jack, and an infrared window for use with the included remote control.

If you don't have a full-size bay, this, you can go with the Audigy Platinum EX



which shares the control panel to an external module, which connects to the PC via a 1.8 m (6.6 ft) cable. Even if you do have a full-size bay, you may want to opt for the EX, because it allows you to bring all of the connections that much closer to your front stereo components.

Both versions come with audio-oriented software bundles. Additional to PlayCommander 3 software features new EAX effects, including time-shifting (slow-down and speeding up of music without changing the pitch), Audio Clean-Up options for use with recordings from older media (like vinyl), equalization, and the ability to burn your MP3, WMA, and WAV playlists to rewritable CDs (audioburn format only, not MP3 CDs), provided you have a CD burner of course.

While the new environmental audio extension is a really nice touch, the big news with the Audigy line may well be the

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inclusion of the FireWire port. Adoption of FireWire has been relatively slow on the PC, even if you don't have any FireWire devices (like digital videocams or certain hard drives, for example). Creative has bundled FirePort software to allow you to

set up a peer-to-peer network with nothing more than a single FireWire cable, fast and easy network gaming.

In the short term, the *Audio cards* will be a best match under Windows 98 or Me. An issue with Macintosh's MIDI equipment means you'll get basic audio, but not

all of the IAX functionality, under Windows 2000. A patch will be posted on Creative's Web site as the issues are worked through. Creative is also working on drivers for X2, which will be posted as Creative's site as they become available.

Collected Fortissimo II
From Guillemot Corp.
www.guillemot.com
Suggested retail price: \$95 (powered from USB)

Collected Fortissimo II

From Guillemot Corp.

www.guillemot.com

Suggested retail price: \$95 (powered from USB)



The Fortissimo II is the newest audio card from Guillemot, and it breaks away from the standard design of most audio cards—i.e., a bracket with a bunch of 1/8-inch audio jacks on the back.

Instead, the Fortissimo II includes only one 1/8-inch jack (for line in) and features optical S/PDIF input and output jacks, for connection to digital-enabled audio devices like a Minidisc. It also has a DIN jack into which you can plug a special cable featuring the standard 1/4-inch plugs for speakers and microphone input, etc. There's also a game port for use with joysticks or MIDI devices.

The short of it is if you don't want to hook up the analog connections, you can just use the optical jacks and have it much more elegant solution.

The card is built around Cirrus Logic's 20-bit SoundFusion CS4624, and the Sennheiser 3D Positional Audio is compatible with a number of audio formats including Macintosh's DirectSound 3D, Creative's IAX (environmental audio), and A3D, as well as Dolby Surround, Dolby Digital, and Dolby DTS. The card can handle 16-bit dual-stereo output and sampling rates up to 95 kHz.

The Fortissimo II is compatible with Windows 95, 98, Me and 2000. Bundled software includes Game Commander SE, Storm Hercules SE Home Studio, MatchMatch! (action), Seas: Foundation tools, Yamaha software, SoundSource Live, Hercules Media Streamer, and Cyberlink's Power2Go player.

Turtle Beach Santa Cruz

From Voyetra Turtle Beach, Inc.

www.turtle-beach.com

Suggested retail price: \$25 (powered from USB)

Turtle Beach's Santa Cruz also makes use of the Cirrus Logic SoundFusion technology with Sennheiser 3D Positional Audio (again, compatible with Macintosh's DirectSound 3D, Creative's IAX, and A3D positional audio). The Santa Cruz card is

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a bit more basic, though, with the standard 1/8-inch analog jacks on the back of the card, run to the game port.

A "wired" jack on the rear of the card can be used for either headphones or dig-

ital output. There's also an internal connector for SPDIF, which will require the purchase of separate cables. The card supports up to six channels of audio, including discrete 3.1 quadraphonic, and surround sound.

Out of the box, the Santa Cruz is com-

patible with Windows 95, Me, NT, and 2000. Drivers for Windows XP are also in development, and should be available on the Turtle Beach Web site in Windows XP ships.

Other software bundled with the Santa Cruz includes Audiomotion MP3



Playback, MIDI Oscilloscope, Digital Oscilloscope (MIDI and digital audio), AudioView (WAV editing software), MusicWrite 2000 SE preview (sheet music), and FXD (play Sampler (key-based composition).

MP3 players

Nomad Jukebox 20GB

From Creative Labs
www.creative.com
Suggested retail price: \$249



Creative shook up the world of MP3 when it introduced the 6 GB Nomad Jukebox, which used a notebook-style hard drive for file storage. With most other portable MP3 devices topping out at 64 MB of storage, spending the extra money for the Jukebox was a real no-brainer for anyone who was really into digital audio.

Still, a wasn't enough for a lot of Jukebox users, who immediately started asking, "can I put a bigger hard drive into this thing?" Indeed, unauthorized Web sites started popping up with tips on how to install a larger hard drive (and void the warranty in the process). Now, Creative has solved everyone's problem (and saved everyone's warranty) by introducing a 20 GB version of the Jukebox.

In pretty much every way, the 20-GB Jukebox is identical to the 6 GB version, from the button layout to the features to the firmware. The Jukebox allows you to store a ton of digital audio and to sort through it all by track name, artist, album title, or using your own playlists.

It's powered by four rechargeable AA-size NiMH batteries (two are included in the box), which charge up whenever you plug the player into the AC adapter.

A couple of minor issues, though. One problem with the 6 GB version was that when the drive was full, it took an awfully long time to load up the player, so it had to cut through all of the files and gener-

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as an audio. That problem is compounded in the 20-GB playback, which can store more than three times as many files. Sometimes it can take between two and three minutes just to get the 20-GB

Jukebox lined up when it's full of MP3 files, and it will take even longer if you have a lot of your own playlists defined.

Secondly, you probably shouldn't try to jam 20 GB of music files onto the player in one go, as we did, because the effort can wear up your PC. If you do it in more

manageable chunks, though, you'll be fine. Once you're done, you will have about 500 albums worth of 128 Kbps encoded audio on your player. That's enough for 15 days round-the-clock listening. Now, do you still need something bigger?

And don't forget, you can still pick up the companion PlayDock (about \$299) from Creative subsidiary Cambridge SoundWorks. The PlayDock is a portable speaker system with a built-in rechargeable battery, featuring a flexible pivoted clip on the top for docking your Jukebox. The PlayDock's battery is designed to last up to 10 hours, so you can take your music with you wherever you go.

Sony Network Walkman NW-M50

From: Sony Corp.

www.sony.com/na/en/na

Suggested retail price: \$599



Sony has two habits that you can always count on: sticking with a recognized and trusted brand name, and clinging to its own proprietary formats. You get both here with the introduction of the Network Walkman, Sony's answer to the MP3 player revolution.

The Network Walkman is a tiny little device that fits into the palm of your hand, and is so small that Sony helpfully includes a key ring that you can attach it to so you don't lose it.

The Walkman connects to a PC via USB for transferring music, and the player will work with Windows 9x (standard and Second Edition), Mac, and 2000 Professional. So far so good.

Where it gets proprietary is in the battery and the memory. Sony uses a very thin rechargeable NiMH battery that is designed to deliver up to 10 hours of playtime from a single charge.

The only problem is, when it runs dry you have to take it home and recharge it, instead of just popping it in a standard battery from the corner store. Of course, you could sink some money into an extra rechargeable battery.

As far as the memory goes, Sony sticks with the MemoryStick, the memory format of choice in Sony's digital devices. This time out it's Sony's SDMG-compliant Magic Gate format MemoryStick, which stores files in AIRACB format, even though you can convert your MP3, WMA, and WAV files for use with the player. Converting and transferring files using the included MG Jukebox software is fairly painless.

Ergonomically speaking, the Network Walkman has both good points and bad. The player is very compact and fits nicely in your hand, with the main control buttons placed where your thumb sits. However, depending on how your hand is shaped, the display window is then under-

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Bringing your audio works together
Continued from page 57

A couple of notes, it will stop if you're playing MP3 files in a particularly bumpy environment, so don't plan to take it jogging. Secondly, you only track addresses will be the track numbers, as no ID3-

based track names are displayed.

No Volt SP 108

FROM: SONY

www.sony.com

Suggested retail price: \$250 (converted from USD \$19)

When it comes to MP3 portability, the Rio line of players started the whole thing. The Volt is one of the newest players in the Rio line, and it handles both MP3 CDs and standard audio CDs.

The player ships with a soft protective cover with a slot for your headphones,



and a spot for attaching the case to your belt loop. The Volt also comes with a remote control clip, so you can place the player into a backpack or into your pocket and roll control your music.

It runs on two standard AA batteries. If you want to save battery life, you can drop the level of shock protection from a maximum of 120 seconds to a lower setting, at the cost of a bit of robustness of playback.

The player itself features a +10 button for quickly navigating through an extensive group of songs, an manual display where each CD can hold between 200 and 400 tracks.

The Volt ships with SONY's music ripping software for creating audio files from your CDs, and Adaptive EasyCD Creator 4 for burning CDs to use in the player. In addition to MP3 files, the Volt will play WMA format files, and can be flash upgraded to support new audio formats as they emerge.

An AC adapter is included for using the Volt at home. The player supports 100 tags, and displays title information in the LCD window.

Samsung CD Vepo MCD-MNP1

From: Samsung Electronics Canada

www.samsung.ca

Suggested retail price: \$99



Samsung has just refreshed its Vepo line of MP3 players, and the CD Vepo is the first to use CD-based media. The player has one of the cleanest designs of the CD-based MP3 players we looked at, with a streamlined shape and very subtle control buttons.

As with the other players in this category, the Vepo easily handles both MP3 and standard audio CDs. When you're playing an audio CD, the Vepo has 100 seconds of

Continued on page 58



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Bringing your music world together

Continued from page 34
into shock, anxiety for extra-second playback. A 130 button is included for rapidly changing tracks.

The Yapp is powered by two onboard AAA batteries, but the player also comes with a battery "holder" that can be attached to the back of the player, adding two AA batteries for even longer life. There is a set of default headphones that can be plugged directly into the player, or into the included remote control clip.

If you want to use the player at home, it has a line-out jack for hooking the Yapp up to your stereo and an included AC adapter. And if you're feeling lonely, the LCD display features a little headbanger wearing guy who makes faces at you as the music plays.

One quibble, though as with a lot of CD-based MP3 players, there is no ID3 tag support, which means your only track identification will be the number of the track on the CD. The playback is rock-solid, though, and at fairly inexpensive, making it a nice value alternative.

Sony Recording

MiniDisc Walkman HI-B000PDC

From Sony Corp.

www.sony.com/europe

Suggested retail price: \$200



Although Sony has a few models in its lineup of Recording MiniDisc Walkmans,

this one sits near the top of the line. It features both a USB Digital PC Link, scanner and a built-in microphone jack (allowing the others plugged for some reason).

This means you can use the M2-R000 for both portable music and for recording in the field. The recording can be done in full quality mode (yielding between 70 and 80 minutes depending on your model), long-play 2 format (for twice as much recording time), long-play 4 (for twice as much again), and more (same as long-play 2).

This flexibility makes it the perfect device for recording either high-quality audio in a studio/studio setting or for those long and boring lectures or private conferences.

The player has flexible power, with a jack for the power adapter, a proprietary rechargeable NiMH battery (also used in Sony's Network Walkman), and a standard style holder for an AA battery, for extra life. The NiMH battery recharges whenever the Walkman is plugged into the AC adapter.

The great thing about the MiniDisc format is that the media is reusable—if you don't like the way something turned out, you simply erase the disc and start recording again. You can easily change the order of your tracks or even stack a new track in between two existing tracks—something you could never do with a tape recording device.

You can import data through the included microphone jack, the line-in jack, or use the optical capabilities of the device instead. The Walkman comes bundled with the USB Digital PC Link, which connects to your PC using drivers that should be standard with Windows or Macintosh OSes, and provides one optical port to your PC, if it doesn't already have one. □

Delving into JPEG2000

The search for ways to compress image files and maintain quality continues

By Jacques Surcouff

For a long while, wavelet compression technology has promised dramatic compression ratios for bitmap images. Some products report compression ratios as high as 100:1 are practical. A number of companies are working toward establishing a new wavelet-based method, called JPEG2000, as an international standard.

Lead Technologies (www.leadtech.com), is one such company employing JPEG2000, and has already delivered its version of the new JPEG2000 compression engine. Since the company's Lead Tools is one of the most popular image-development toolkits, this JPEG2000 version will influence how a lot of graphics software and digital camera vendors assess JPEG2000's readiness for prime time.

Image compression is vital for at least three quickly growing IT sectors: the digital camera industry, Web development, and database vendors. For example, in order to keep costs down, digital camera makers limit the amount of expensive memory they include with their products and deploy JPEG compression to fit more images into the limited space. JPEG is what is known as a "lossy" compression method: the image permanently loses some details

and/or colour information in order to reduce the file size by 10 times or more.

Web developers are also very concerned about image size and compression ratios. If a 200 KB image can be reduced to 20 KB with minimal loss of detail, download times can drop to four seconds from 40 seconds over a 56Kbps modem.

JPEG2000 is unusual in that it offers both lossless and lossy compression. It is also characterized as a multi-resolution format, which allows several resolutions to be efficiently encoded within an image file.

Finally, database vendors are being called upon to store ever larger amounts of photos and images. Currently some database vendors do advanced-lossless compression on images as they are stored and automatic decompression when they are retrieved. This is another industry that is very interested in how much more compression they can achieve with

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Delving into JPEG2000

Continued from page 56

JPEG2000

JPEG2000 is unusual in that it offers both lossless and lossy compression. It is also characterized as a multi-resolution format, which allows several resolutions

to be efficiently encoded within an image file.

The evidence

Even fairly simple JPEG2000 compression tests show that there are some gains to be achieved. First, the tests of lossless

JPEG2000 showed file reductions of three to seven times.

We judged that to be about five percent better than PNG (portable network graphics) or lossless compressed TIFF (tagged image file) formats.

We tried well over a dozen images and

simply could not discern any loss of detail, corruption, or colour shift in the JPEG2000 lossless compression. We also felt that JPEG2000's lossless had a slight colour fidelity advantage over PNG in the areas of colour shifts, slight differences in colour boundaries, and noise artifacts in solid colour areas.

But in the area of lossy compression, JPEG2000 really shines. Here we compared an uncompressed original bitmap file of 2,294 KB with files that had been compressed to 75 KB with JPEG2000 and with the old PNG.

In our estimation, the JPEG2000 method produced a much better image than its predecessor.

And in compression rates (increase to 40:1 and 50:1), the new JPEG2000 retains fidelity to the original file much better than the old PNG. In general, we found that JPEG2000 could out-compress the old format by about three to eight times while retaining comparable quality.

Summary

The tests of the new JPEG2000 image compression showed mixed results (see lossless compression typically used for database storage and very high quality Web images, we couldn't see more than a marginal improvement over PNG and compressed TIFF).

However, there were a number of files JPEG2000 could compress (at nearly a dozen) that we simply did not test in detail. So perhaps there is still more to be improved on.

However, in the case of lossy compression the tests showed that JPEG2000 shows off very well. □

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Delights of Chemistry

Hi—This Web site offers step-by-step procedures, explanations and animations of chemistry experiments designed to make you the life of the party. All these experiments produce mind-boggling dramatic results, sponsored by the School of Chemistry at the University of Leeds in England. Delights of Chemistry experiments include the old standby volcano effect caused when crystals of ammonium dichromate are heated to become volcanoes upon chromium oxide. The name "volcano" derives from the mountains of ash complete with spewing effects produced in the reaction. Other colorful and somewhat less loud chemistry reactions include the Burning Bag, the Reactionary Columns, and the Phosphorous Moon. Guaranteed to appeal to that budding mad scientist in the family.

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A new hacker sport, war driving, reveals how poorly security features are deployed on wireless networks

By Tom Ichniowski

Even before Ben Sapers left his building, he found three wireless networks that he could—if he wanted to—hack into. By the time he reached the top, he had found two more.

"And there's another one," Sapers says as he dunks into the cab, his laptop leaping out the window. A discoverer as he looks a small omni-directional antenna in front of him.

By the time the cab has driven five blocks through the heart of downtown Toronto, he has picked up 17 wireless networks—nearly all of which could be broken into by a malicious hacker and used to gain access to internal corporate networks and the valuable information they contain.

What Sapers, director of research for KPMG LLP's Information System Security (iendurance) Group, was demonstrating for *The Computer Paper* was "war driving." His job is to determine just how much of a threat it is to the security of Canadian businesses.

"In a nutshell, war driving is searching for wireless local area



networks (WLANs), and then attempting to access whether they are vulnerable if you are a malicious individual breaking into them," Sapers says. "It works with off-the-shelf hardware, wireless cards that you can purchase from any computer retailer, and the

Continued on page 67

Corporations'
replies to email
still spotty,
survey finds

LONDON, England—The lights are on, but nobody's home. That seems to be true of several of the major companies in the U.S. and the U.K. that were emailed requests through their Web sites for investor information, for a study by a marketing communications consulting firm, Ramer (ramer.com).

Responses to such requests are still highly unpredictable, according to Ramer, which published results of its third annual *Web Index Study* in early September. Ramer reports that major companies on both sides of the Atlantic are at odds as to what investor information requests made over the Web are worth their time.

The survey found the Financial Times Stock Exchange (FTSE) top 100 companies in the U.K. and their U.S. counterparts to the Fortune 500 index, and found that more than 20 percent failed to respond within 10 days.

The requests for investor information were routed through the firms' Web sites. Some 25 of the FTSE 100 companies and 20 of the Fortune 500 firms appeared to ignore Web-based requests.

Steve Reiff, a spokesman for Ramer, said the results of the annual survey are used as case studies for the marketing company's clients, rather than for any of its client companies specifically.

"The annual survey allows us to gauge how major companies are or are not, as the case may be, dealing with inquiries from members of the public," he said.

While some companies are speeding requests, he said, some have dramatically improved the way in which they deal with requests for investor information.

"Giga-fido is a classic example of this. As soon as the inquiry has sent off his or her message, a pop-up little animated cat to tell the Web user how their request will be dealt with," he said.

Raiff added that this year's research suggests that some companies that previously were responsive to information requests have actually reduced their services on Web sites and started ignoring e-mail entirely.

"Some companies have clearly turned

Continued on page 66

Adventures in network land

Cost, ease of installation important for SOHO networking

By Susan Ichniowski

You thought your small-business was already wired because it's connected to the online world. But now it's growing and you need to share information with co-workers, or being wired calls for a new definition: network.

Linking your office computers together creates a network through which you can share the printer, files, and other information between the people in your small group. A computer network can be wired or wireless.

Simply wired

A simple wired network can be set up in your home or small office using Ethernet network interface cards (NICs) and wiring to connect the computers together.

One simple network type uses NICs and coaxial cables (similar to cable-TV wiring) to connect computers together in series (A to B to C, etc.). The computers at either end of this chain have to be equipped with devices called terminators.

Another type of Ethernet network uses network cabling (similar to the lines coming from your telephone in the wall jack)

and requires a device called a hub. The network hub, like a wheel hub, is the central connection point for all the computers on your network.

The cables and connectors are called RJ-45, which resemble RJ-11 telephone jacks but are wider. When you purchase a NIC, you may find that it has both a coaxial and RJ-45 connector.

So, to create a simple network, you need:

- NICs for each computer
- coaxial cabling to connect each computer

Continued on page 63

Advantages in network land

Continued from page 61

to the rest at a close configuration (if you choose this method), and terminals for the computers at either end of the chain.

and if you choose the other option, a hub and RI-45 cabling (in the configuration, the wiring runs from each computer to the hub, rather than between computers).

The main feature of a wireless network is, of course, no wires, and that offers several advantages at home or in a small office.

Simply wireless

A wireless network, such as an 802.11 setup, is similar to the RI-45-based network. Instead of a hub, however, the type of wireless network uses what is called an access point. Each computer on the network uses a special network card that communicates to the access point using radio frequency (RF) signals instead of cabling.

The main feature of a wireless network is, of course, no wires, which offers several advantages for a home or small office environment.

It eliminates the need to install cabling, which can be costly. The computers can be located anywhere within the range of the receiver, which is typically 180 ft (328 ft) outdoors, and they can easily be moved without the need to re-run any cables. No cables means less clutter.

Some manufacturers have combined the wireless access point with an Internet gateway so a single Internet connection can be shared by all the computers on the network.

[See "Wireless LANs: what's up?" on this page to find out about security issues related to wireless networking.—Ed.]

Network solutions

If you use Windows 95, 98, or 2000, creating a point-to-point network is relatively straightforward.

While we can't describe all of the variations here, there are a couple of steps that are essential to making sure all of your connected computers belong to the same workgroup (found in the "Identification" pane of network properties in Windows 95, for example) and that the appropriate network protocols are loaded in your NICs (for peer networks, this may require both NetBEUI and TCP/IP configuration).

An oval, if you want to run a Mac on the same local area network (LAN) as systems using Windows, you may need to purchase additional software, such as PC

MacLAN from Microsoft Systems (www.microsoft.com).

Get features

The hardware cost of setting up a small wireless network is relatively low. You can purchase a NIC for as little as \$16,

although the cards we used for our setup were about \$100 each. A 1-ft (3-ft) RJ-45 cable costs about \$4 (longer cables will be more expensive). A bargain basement five computer hub costs around \$70.

The cost of setting up such three-computer network can be follows.

Item	Quantity	Price/unit	Total
NICs	3	\$100	\$300
45-ft cable	3	\$4	\$12
1-ft cable	1	\$4	\$4
Hub (5 ports)	1	\$70	\$70
Total (before tax)			\$426

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Advances in network land
Continued from page 63

In contrast, a wireless network connecting the same number of computers would cost considerably more. Wireless network cards range in price from \$280 to \$400 each, while access points range from \$400

to more than \$1,000.

Best of all worlds

However, the latest products combine features—Internet sharing, wired local area networking, and wireless networking—that you could not previously get without

employing three separate devices.

One such product is the Wireless Home Gateway, from 3Com (www.3com.com), the subject of this field test. This is no Internet sharing device, as it has a port that connects directly to a cable or DSL modem. It also includes a hub—in this case, one with

three ports. And it's an 802.11 wireless access point that supports up to 35 additional computers (with requiring wireless network cards, which have to be purchased separately).

We started by installing the Wireless Home Gateway on our home office computer in the basement. To set up the Internet gateway, we needed to use an IP address and an Internet browser. Known as "surfing the boat," this is how you access the Internet for configuring the Internet sharing device. Neither Internet Explorer 5.5 or Netscape 4.7 could find the gateway, but after some tinkering we eventually found the setup screen.

Our next problem was the password for the setup. In the user guide it stated the password was blank. We discovered that the password had been set to "admin" (this may have been done by another person testing the review equipment before us).

Once access was gained, the software setup was fairly straightforward. We needed a lot of information from our high-speed Internet service provider (ISP) to set up the gateway. Typically, you need the user name and password of your Internet account, and some details about how the service has been set up. (Hint: get this information from your ISP before you start installing a device like this.)

Next, we installed a wireless PCI network card into our test computer (a five-year-old 100 MHz Pentium system). The instructions in the Quick Start Guide were not accurate and the software didn't install in the guide and it would. Since I knew how to manually install a computer device, I was able to install the card. This, however, is not something everyone can do easily.

With the wireless card and gateway in place, we expected to be able to browse the two computers and install a networked printer on my son's computer. But, even though the lights on the card and gateway indicated there was a wireless connection, we couldn't see the other computer.

After fiddling around with the device for more than four hours, we gave up and uninstalled them. Thinking that there might be compatibility problems with the older computer, we brought the device to the office where we have better, newer computers.

There, we were able to set up the Wireless Home Gateway and connect three word workstations easily. The gateway easily connected to our high-speed modem and accessed the Internet. We were even able to install the wireless PCI and PCI Card SBUs on two computers and they communicated with the gateway just fine. We had five computers on the network, three wired and two wireless. The only problem was that the wireless side of the

Continued on page 66

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Limits while open

Continued from page 67

some several of the vendors' networks through their wireless connections. He was able to see their servers, presentations and had access to everything. He could have done anything he wanted to."

A few days later he heard another story about how easy it was to access corporate networks through WLANs. According to Kanelakis, a technician helping to set up a WLAN for a company in a corporate office building took a walk with a notebook and wireless modem to check the range of the new network. He walked around the office, then decided to see if his connection would work on the floor below. "He was surprised that he was still on the network, only it was another network he was now connected to," Kanelakis says.

So what if it that stolen wireless LANs to stay far from hackers to exploit?

Part of the problem is the nature of the protocol used in the WLANs. In early February, researchers at the University of California at Berkeley posted information about security flaws existing in the IEEE 802.11 standard used in wireless networks. The researchers found ways to break the Wired Equivalent Privacy (WEP) security algorithm that was supposed to keep a wireless network secure from hackers.

In July, attendees at the Black Hat

Devilgals conference held in Las Vegas, Nev., were shown how the WEP protocol could be cracked—in under 30 seconds in some cases—to access the traffic passing through a wireless network as well as the corporate network it is connected to.

"The way the WEP algorithm has been implemented is incredibly weak," says KPMG's Sapora. "The algorithm was designed without consultation with the industry's leading encryption specialists. So when it was implemented it was not done properly."

You would never put a wired Ethernet jack on the outside of your building where anyone could walk by and connect to the internal network. But that is essentially what you are doing with wireless technology.

Recently, Sapora says he has come across software on the Internet that allows users to easily break WEP on a network. But even if you don't have the software, a little bit of patience can also do the trick.

"To crack WEP, all you really have to do is be close to the network, pick up the sig-

nals and with about 100 MB of traffic you then have enough information to start figuring out what the encryption keys are," Sapora says. "And once you do that, you can bypass WEP."

An even more basic problem is that when people set up WLANs, they often don't bother with security.

"As in most things with security, the vendors making the standards have made mistakes and then the customers deploy them with mistakes," says Chris Mynopoul, director of research with Cambridge, Mass.-based Inteltek Inc. (www.inteltek.com).

But by far the biggest problem is that customers don't deploy even the rudimentary security mechanisms that are built in. Wire driving works because most of the security mechanisms have been turned on, and the networks are left wide open. For example, you would never put a wired Ethernet jack on the outside of your building where anyone could walk by and connect to the internal network. But that is essentially what you are doing with wireless technology."

The Gartner Dataquest study looking at the problems with WLANs and the 802.11 protocol suggests users either use a browser that supports SSL to encrypt data going over a wireless network or use a virtual private network (VPN) to connect to sensitive networks. In this way, access could

be restricted to authorized users.

A recent NANS Institute report suggests several possible measures to counter wire driving, such as avoiding convenient defaults for encryption keys and even conducting a war driving test on your own wireless network to see where the vulnerabilities are in order to develop appropriate security policies.

As well, the study recommends altering network uses that wireless transmissions extend beyond the walls of the office and containing them about sending sensitive information across such an open system.

But with every added bit of security comes a trade off with ease of use. WLANs have grown in popularity because they are cheap and easy to set up. This has made them especially attractive to smaller businesses looking to save on costs and corporate departments looking to set up a network quickly. If added security features make WLANs more difficult to set up, they are likely to be less popular.

That is why Sapora says Kanelakis says that no one is going to solve the security problems of WLANs.

"Security is a process, not a product," Kanelakis adds. "You don't get in this magic box and it then all of your security problems. Security involves prevention, assessment, detection, response and correction." □

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HP simplifies business PC lineup

By Tom Venzke

HP's Hewlett-Packard Canada (hewlett.ca) announced that it has created two separate product lines to serve business customers in an attempt to appeal to companies with high-end needs as well as those looking for more affordable systems.

"We are moving to separate the product line into two streams," said Daniel Koss, business manager for desktop PCs with HP, in Mississauga, Ont., during the launch of the new lines in early September.

"The Professional line gives HP reliability and technology at a really good price point. And on the Professional side of things, customers are interested in the value-add we are giving the product, not just on the hardware side. So things like also on the feature set side of things."

The Professional line includes the e-PC 40, which HP says is a "revolution" of a popular system that debuted last year. The original e-PC was made up of three components: a chassis, hard drive, and external power supply. The new model has an extra removable component: memory.

"One of the main customer feedback points we were getting was memory," Koss said. "The original concept was a sealed box where you could not upgrade the



The streamlined e-PC 40 (above, with closed lid) and the desktop e-PC 40 (below) are part of Hewlett-Packard's new Professional line.

memory. That was following the standard of corporate use where you replace the box instead of upgrading."

The new e-PC 40 comes with 64 to 256 MB of SDRAM that can be increased to a maximum of 512 MB using the two memory slots. It also has an Intel Celeron processor (from 500 MHz to 1.1 GHz), and will support Pentium 4 processors by year end. It also comes with an Instant Swap support pack upgrade, a same-day, on-site parts replacement service, remote data CD-ROM drive, and a Port Control

System for linking the PC and preventing users from changing its physical configuration.

The Professional line also includes the Vectra v1 1420, a Pentium 4-based system that is designed for easier management and upgrades. The components—including additional memory and the hard drive—are easy to access, and can be simply swapped into place or taken out for upgrading.

The Essential line includes the Vectra e110 PC, which also features flexible upgrading options, and is both Windows and Linux certified.

HP has also introduced several new support packages including Lifecycle Solutions like HP Rapid Deployment Solution that automatically sends out software images across multiple PCs and customers OS applications, and using a PC Image Expert for restoring the OS and recovering previous software and Image Stability, which allows for a single software image to be distributed across all new e-PCs.

IT departments can also use HP's e-Diagnose to troubleshoot. The tools will determine whether a system's problems are hardware or software-based and send a message to a help desk where a problem is discovered.

John Stuenkel, hardware research analyst with International Data Corp. in Toronto, said the new diagnostic and support tools should help HP make a strong play in the business market, where Dell has made substantial gains with its aggressive pricing. HP is looking to counter that by stressing the importance of support as a key to keeping IT costs down. □

Advice for the working stiff

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HP launches first Pocket PC 2002 PDAs

Hewlett-Packard (hp.com) has released two new colour personal digital assistants (PDAs), which it says are the first to feature Microsoft Pocket PC 2002 Personal Edition software.

The Jornada 568 and 568 each have a Type I CompactFlash slot for adding memory cards and optional accessories. The new devices are powered by removable rechargeable 14-hour lithium-polymer batteries, include HP Safe Stone (which offers an additional 3 MB of hard-disk for logging), a 262K true-colour TFT reflective colour screen, and an Intel StrongARM 265 MHz processor.

Microsoft's latest handheld OS, Pocket PC 2002 Premium Edition, provides a suite of Pocket applications, including Outlook, Word, Excel, Internet Explorer, Personal Services, Quick, MSN Messenger, Microsoft Reader 2.0, and Microsoft Windows Media Player 8 for Pocket PC. In addition to the Microsoft applications, HP has included Landwin's Own-Solve business calculator and Developer's Own's Coordinator Pro for organizing personal and financial information. HP's Dial and Microsoft software, allow enterprise users to develop and run Java-based applications. Currently, Microsoft® supports a

wide range of popular VPN servers to enable secure remote access to the corporate Internet.

The Jornada 565 features 32 MB RAM and has an estimated retail price of \$499. The Jornada 568 has 64 MB RAM and an estimated retail price of \$599.

—TCP Staff

SCM, MainConcept to deliver DV software

SDI Microsystems (www.sdicons.com) and MainConcept GmbH (www.mainconcept.com) have announced plans to jointly develop and market software for the thriving digital video market.

SDI is best known for its Barrio product line, including its Digital Video Creative series, and has recently expanded its focus to include the PC and consumer electronics OEM market.

MainConcept has years of video technology development in the areas of compression/decompression (codec) and high-end video software. MainConcept's end-user product line includes the popular MainConcept video editing suite, MainConcept's compression and effects program, and studio-line codecs for enhancing the performance of digital video various software applications.

—TCP Staff

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Gracie offers small biz suite in Canada

Gracie (www.gracie.com) has expanded its Gracie Small Business Suite for Canadian users with two new online services.

The suite includes new functionality for building Web stores, Web sites, and customer relationship management (CRM) that complement the Canadian version of Gracie Small Business Accounting, which was launched in June 2000.

Canadian users can now create online stores or e-commerce Web sites that will calculate GST and provincial taxes.

The new CRM services for Canadians include an integrated contact manager, company manager, task list, and calendar. In addition to viewing contact information and company records, users can track communication and transaction histories through a single screen. Events and tasks can be created, assigned, priority levels set, and status monitored.

Gracie says services in the suite are integrated to eliminate redundant data entry. For

example, orders placed in a company's Web store automatically create a sales order in the accounting system and update customer history records.

Businesses can create an online catalogue using their Gracie Small Business inventory and service items, which will be updated if they change prices, product descriptions, images, or add items.

The Web store service is US\$49.95 per month, the Web site service is US\$19.95 per month, and CRM services are US\$19.95 per user, per month.

—TCP Staff



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Attacks spark renewed interest in biometric security



WASHINGTON, D.C.—Biometric technology companies—long clogged by concerns about the constitutionality of using their products—have enjoyed substantial share price gains in the weeks following the biometric attacks in New York and Washington.

Publicly traded biometric companies like Vericonics Corp., Image Technology, and Imago Technology, which sell competing "facial recognition" products, have seen their share prices more than double.

Vericonics Communications, director Frances Delany predicted that in the wake of the terrorist attacks there would be a "shift in the rhetoric" surrounding biometrics. "A lot of the things we've been talking about as a company—as an industry—may be best left better."

Biometrics is the science of identifying people by their physical characteristics (fingerprints, facial contour,

corneal pattern, etc.)

While some law enforcers have disputed the value of biometrics in catching suspected criminals, privacy advocates have soundly criticized efforts to use biometric technology in public places.

A decision by officials in Tampa Fla., to outfit the city's downtown area with cameras capable of constantly piping images through a computer running a biometric face-scanning program, drew national criticism earlier this year.

As able to a longtime congressional opponent of biometric scanning in public places has said lawmakers must remain "vigilant" against attempts to pass biometric-friendly laws in the wake of the attacks. The aide, who asked to remain anonymous, conceded that it would be "more challenging" to fight off such laws in the current political climate.

—Anselyn Cox

Extensive hand readers from Recognition Systems of Campbell, Calif., are currently used in many airports.

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Intel Pentium 4	1GB	80GB	17" CRT	\$1399

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Fee-based music firms must offer a lot

CAMBRIDGE, Mass.—As they get set to roll out promised digital-music subscription services, the recording industry is going to have to get used to some hard facts, a new report from the WebScene (www.scenesite.com) digital entertainment research firm suggests.

There is, a lot of young people are saying they simply don't plan on paying for digital music, according to WebScene.

For instance, in their report, WebScene recently surveyed 1,800 US-based college-age Web users, and also interviewed senior executives from 28 major digital-media and technology companies.

According to that report, 42 percent of college-age users believe they will continue to access MP3 music files for free through non-commercial, peer-to-peer online services like Beamer (www.beamer.com), MusicShare (www.musicshare.com) and Kazaa (www.kazaa.com), or even just through email, with no plans to stop.

At the same time, big media companies like America Online (www.aol.com), Microsoft (www.microsoft.com), Napster (www.napster.com), RealNetworks (www.real.com), MP3.com (www.mp3.com), and Yahoo (www.yahoo.com) all sit at the head of preparing music subscription services. Two of them, MusicNet (www.musicnet.com) and Pressplay (www.pressplay.com), represent the live music record companies. They plan to ask music fans for monthly subscription fees in return for access to a big menu of digital, downloadable songs.

If free MP3s are going away, and Ric Duke, a senior WebScene analyst, concedes online music services will never be able to compete. Not, that is, unless

they engage their considerable resources and their direct relationships with artists to make online offerings far superior to their own.

This means that the record companies need to up off their customers, offering free stuff to get them on the case, then offering bits of paid service much as the cable-TV world, going subscribers as much service as they are willing to pay for.

"The idea with turn it is that you have to increase more than just the amount of music that a person can consume," Duke said. "The problem is that there is so much free music available that any commercial service is going to have to give access to more than what people can already get for free."

So then, to borrow a phrase from the Recording Industry Association of America's (RIAA) chief, Hilary Rosen, how do you compete with free?

Duke says his research suggests it is possible. WebScene says some young people are expressing interest in paying for subscription services, providing they get more than just music for their money. They need support services, and new kinds of programming—for instance, bonus, exclusive online concerts accessible only to subscribers.

"We're going to see a fundamental change in certain sets of artists, what they produce as products," Duke said. "The hard-copy recording is what the music industry is built on, that is the promise because that is what has been technically difficult over the years. Now, with the

Internet, streaming media, digital technology, you can commercialize a lot more aspects of music than just the hard-copy recording."

WebScene says some young people are expressing interest in paying for subscription services, providing they get more than just music for their money. They need support services, and new kinds of programming—for instance, bonus, exclusive online concerts accessible only to subscribers.

Various analysts have talked about such bonuses as virtual backstage passes and online access to the rehearsals of their favorite artists as two examples of this. There are other possibilities as well, such as providing access to pre-released songs, discounts for CDs, or early access to concert tickets, Duke said.

Duke calls this kind of personalization "super-serving" the customers. That is where the whole model for the music business could begin to change, Duke said.

"When a band signs a recording contract with a record company or some other division of a total media conglomerate, they'll have to consent not just to producing albums once every two years, but also to super-serving their biggest fans

who are paying a monthly fee or an annual fee for their service," Duke said.

Here's how that could work. Someone could pay monthly to access the sort of stuff they already get at music labels' Web sites—news, a few simple streaming songs, photos of their favorite stars, that sort of thing. For US\$4 a month, maybe they could get the kind of personalized online stuff that MusicMatch (www.musicmatch.com) provides. A US\$4 monthly fee could support a certain number of song downloads. And \$20 a month could open up the floodgates: "You select your favorite artists and they super serve you on a monthly or an annual basis," Duke said.

There are two backbones for the music industry to making those services work well, Duke suggested. One is the structure of the copyright system. Each song has at least two copyrights attached to it—one for the composition and one for the recording. That is why the music industry has labored hard to clarify songs as "works for hire," so that once a recording is made, the copyright constantly belongs to the label and the firm needs only to pay a flat fee to artists for their work.

They might try to expand work for-hire status to subscription services so they can simply pay flat fees for digital distribution without having to cut artists in on their online profits based on the number of times their work or their image is accessed online.

The other main backbone is really just a music-industry attitude: companies have expressed a desire not to make digital music portable. In other words, if fans

Continued on page 35

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Platform News

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Apple Reports

Office:mac gets Aqua interface

By Justin Siemsen

As we were wrapping up this issue, the United States was stuck by unfortunate acts of terrorism on Sept. 11. In the first few weeks following that tragedy, people weren't thinking much about computers and many product announcements and trade shows—including Apple Expo Paris, which was scheduled for Sept. 26 to 30—were cancelled. In the aftermath of such an event, it does seem silly to be talking about megabytes and gigabytes, but that is what we do here and so we must go on.

Microsoft announces Office X

Microsoft's Macintosh Business Unit (microsoft.com/mac) has announced the official name and pricing for its new Mac OS X suite of business applications, Office mac v. X. It will be available in November. The new suite picks up where Office mac 2001 left off. Microsoft claims



encourage the current member application in Microsoft's Office mac suite with more flexible scheduling and enhanced message editing tools (below).

product that will run on Mac OS 9 or older, Office mac v. X requires Mac OS X 10.1 or above. The suite contains the same applications as 2001—Word, Excel, PowerPoint, and Entourage. All the apps have been rewritten for OS X and feature new Aqua-like interfaces. Entourage—the newest member of the suite—has changed the most and does not have as much legacy code as the other three apps.

Among the improved features in Entourage are a new Address Book with better international support, a revamped calendar that offers greater scheduling flexibility and takes different time zones into account, and enhanced message editing tools based on those in Word X.

Office mac v. X will also include a fully compressed copy of MSN Messenger 2.1 for

Continued on page B4

RealOne blends video streams, music files

SEATTLE—RealNetworks (www.realnetworks.com) has unveiled new software that combines its programs for playing streaming media and managing stored digital music.

The new application and related tools for developers, which RealNetworks calls the RealOne Platform, will also serve as a gateway to subscription music services that use the Seattle, Wash., company's RealSecure tools for secure media distribution.

In addition, the company said it will launch its own monthly subscription service for premium content that would be based on the new platform.

RealNetworks said that RealOne-compatible software development kits (SDKs) are now available, as is a free, pay-to-use preview version of the desktop software for consumers.

The new software combines the company's Real Jukebox software—which can be used to create, copy and play CDs as well as to organize downloaded digital music—with its subscription streaming audio and video technology.

That combined approach, which is dis-

Continued on page B8

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Apple News

Continued from page 43

OS X 1.1 will be integrated into the Office Notebooks system, which also handles Encourage event notification, and Microsoft.NET messages, even when the office suite is closed on your system. The standard upgrade price for OfficeMac v X will be US\$199. The full price is a whopping US\$499, but customers who own Office 2001 or Word 2001 Special Edition can get it for US\$149, if they order direct from Microsoft.

New Viewers more of same, good value



HandSpring (www.handspring.com) introduced its product line with two new offerings.

that are very similar to the models they replace, but offer better bang for the buck. The new handhelds are the View Neo and the View Pro, which list for US\$199 and US\$299, respectively.

The Pro is essentially an upgrade of the Platinum, retaining that model's four-bit grayscale display, silver case, 33 MHz CPU, and Palm OS 3.5.2. The only additions to the Pro are the rechargeable lithium battery (instead of AAAA), and a memory increase to 16 MB (from 8 MB). Having that much memory allocated is a first for any Palm OS device (which use expansion cards to increase memory). No doubt the Pro will appeal to the business traveler who can fill it with contact maps, and checklists before each trip.

Those who feel 8 MB of memory is enough may find the View Neo more suitable. The Neo replaces the View Deluxe line, but is basically the old View Platinum, in new clothing. The Neo features all the specs of the Platinum, including a 33 MHz CPU, Palm OS 3.5, four-bit grayscale screen, and four to six weeks power from a pair of AAAA batteries.

The Neo comes in three colors, red, blue, or "tanaka" (a translucent gray), whereas the Platinum only came in silver. The Neo is a step improvement over the Deluxe, which had only a 16 MHz CPU, two-bit grayscale screen, Palm OS 3.1, and

was the same price as the Neo.

If you already have a View Platinum, Pro, or Edge, there is no real reason to upgrade to either of these new models unless you really need the 16 MB RAM the Pro offers.

For those new to the Palm OS looking to pick up their first PDA, we recommend the Neo, which for its estimated street price of \$100, offers you everything you need for about \$150 less than the old Platinum or new View Pro.

All HandSpring models include Mac drivers at the box and a USB HotSync Cradle (which is not the case for all Palm handhelds, many of which require the purchase of a separate USB connection box). Yours can be ordered through the HandSpring Web site, which offers free shipping to Canada.

StuffIt Deluxe 6.5 adds new features

Aladdin Systems (www.aladdin.com) has released another update to the Mac compression tool StuffIt Deluxe. The new version, 6.5, improves on the previous release by adding much more OS 9 support, as well as some new features for both OS 9 and X, such as improved Palm and Unix support, and a free included copy of the new StuffIt Express Personal Edition.

StuffIt Express Personal Edition is like a macro language for StuffIt Deluxe. It



allows users to create drop boxes on their desktop that will trail a file and then perform a task such as unzipping or FTPing the file to a specified address. When Aladdin tried to sell this technology in Aladdin Transporter for \$99 it seemed a little much, but including it with StuffIt Deluxe is brilliant and will no doubt get many more people using the stuffie virus.



Continued on page 48

Bright Green's Inter-Internet Corporation Closes Book

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« PLATFORM NEWS »

changes? Like moving the recycle bin to the bottom right of the desktop. So Mac users will feel more at home?

And why is the recycle bin the only item on the desktop?

It keeps asking if I want to connect and activate with Microsoft. I'm gonna wait and see what happens.

With my high-res screen I have to use the large fonts setting, but there's a new control where large fonts used to be (`DisplaySettings.Advanced`). The new control lets you set your resolution, if it's higher than the standard 800x600.

There's stuff I really had to search for, like the volume control. Wasn't in the toy anymore. Dogs, not even called the toy anymore, it's the Notification Area.

I eventually found it on the Control Panel's sound thingy (there isn't a multi-media thingy any longer). And then I had to change the properties for the notification area (Taskbar and Start Menu Properties/Customize) so that it didn't "hide when inactive".

Later read in the Help that XP doesn't include an MFCG decoder? Makes no sense.

We watched *The Wizard of Oz* on DVD. I like how the DVD player downloads the movie graphics and names of the chapters, just like a CD. The way that the on-screen tools appear and then just slide away in full screen mode is nice too.

Day 3.

spent most of the evening getting the front ideas back to the way I like. The new one looks nice, but it's just been frustration for me. I'm doing everything the way I used to do it anyway and it's cumbersome with the new layout.

When I went back to the classic Start menu, the standard desktop icons returned. But by then I'd already found out how to get them to appear (`DisplayDesktopIcons`).

Although I did figure out how to get the Room Documents back on the new Start menu (Taskbar and Start Menu Properties/Customize/Advanced), I'm happy to have the whole thing back like it used to be.

Maybe it makes sense after all, if you think that the kinds of things Microsoft wants you to do—read, Web-browsing, using the Media Player—aren't exactly about documents. Anyway, I'm staying with the old Start menu for now. The classic Start menu has some new features on the advanced settings menu, including non-www.controlpanel.com/windows

Daily 10

Everything seems different, and nothing seems to be where I'm used to finding it. Maybe it's easier for people who were using Windows 2000? When you right-click My Computer, there are "Manage" and "Properties" selections. The Properties is particularly a much expanded from Windows 98 SE, but that could be better discussed.

Get the dual-boot thing solved as a result. There's a setting (System Properties/Advanced/Taapay and Recovery Settings) that lets you choose the OS you want to boot by default and how long the selection screen stays on. But I am now doing neat things with XP and kinds settings used to it.

Decided to fine-tune my installation, get rid of things I don't use, and maybe set up some utility stuff that's not installed by default. With Windows 98 SE, I used to uninstall parts like Accessibility, but that's no longer an option.

I really wanted to get rid of MovieMaker, because I'm using VideoWave to edit videos, but there's no way to do that automatically. You can uninstall Base and iMovie, which is

Continued on page 98

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We watched *The Wizard of Oz* DVD. I like how the DVD player downloads the movie graphics and names of the chapters, just like a CD. The way that the controls appear and then just slide away in full screen mode is nice too.

SafeVIEWer, which worked fine, and then the XP DVD Master worked too.

Online & Connected

Internet Trends • Wired and Wireless • Online Services • Work & Play on the Web

Canadians balk at content fee

TORONTO—A new survey suggests that it won't be easy to win Canadian Internet users from their traditional diet of free Web content.

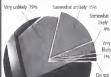
Research company Ipsos-Reid (www.ipsos-reid.com), stringing up the task ahead for Web publishers and Webcasters contemplating subscription fees, said that just 19 percent of online Canadians are clearly open to the idea of coughing up cash for content.

The survey, summarized in the company's latest *Canadian Internet Use Report*, found that 79 percent of Internet users are strongly opposed to paying weekly or monthly subscription fees for Web content, saying they were "very unlikely" to pay. Another 19 percent said they were "somewhat unlikely."

Chris Fernerbaugh, vice president for technology research at Ipsos-Reid in Toronto, said that the preference for free-loading contrasts with the goals of many content providers, that aim to fill broadband connections with fee-based streaming audio and video or charge subscription fees for news and other information.

Likelihood to pay for content

Q. Canadian respondents were asked: How likely would you be to pay a monthly or quarterly fee to access news and information from your favorite sites?



Source: Ipsos-Reid Canadian Internet Use Report

Fernerbaugh said Ipsos-Reid is convinced there will be an increasing amount of fee for content on the Web, but the companies leading that drive are going to need deep pockets.

"In the short term, it's going to be a struggle," he said, "and [publishers] will have to face the fact they will lose a lot of eyeballs when they begin charging."

The most recent Ipsos-Reid surveys for the report, conducted in late June, found that men and women were equally disinclined to pay for content online.

Older Internet users were slightly more amenable to the idea of paying their own way. Ipsos-Reid said seven percent of those over 55 and they would pay, while just four percent of those between 18 and 34 years were so eager.

And among the five percent of all those who said they might pay, the level of enthusiasm dimmed dramatically as they contemplated an escalating range of possible subscription fees.

Ipsos-Reid said 75 percent of those who expressed a willingness to pony up were "very likely" to pay a \$3 monthly fee for content they wanted, while the rest were "somewhat likely," but when asked if they would pay \$20 a

Continued on page 35

10 sites for robot products, news, research

By Keith SchneggenRoberts

1. **Robotix.net** If you're looking for the latest in robotics news, look here. This news site links to articles on personal and industrial robotics, robot competitions, and more. It's also the home of a Robot Competition FAQ and a gallery of readers' robot pictures. www.robotix.net/



2. **Lego Mindstorms** Today, many kids interested in building their own robots start with Lego's innovative Mindstorms sets, which combine traditional Lego building blocks with things like motors, touch sensors, gears, tracks, and the software to drive it all. This site has Mindstorms products and provides tutorials, an online forum for would-be robot developers, and a Hall of Fame section highlighting interesting designs. mindstorms.lego.com/



Radio tunes into digital potential

Next-generation broadcasts will give listeners content control

By Tom Vennels

Just as many AM radio listeners turned their dial to FM because of its improved quality, the emerging digital radio spectrum may see listeners migrate away from traditional analogue radio altogether, attracted by the variety of content and flexibility of the digital offering.

"Digital radio broadcasting [DAB] is a quantum leap, taking us past FM and into a higher level of quality and fidelity," says Doug Korman, president of Digital Radio Roll Out Inc. (DRRI) in Toronto.

Recently, DRRI announced plans to do a study to lay the groundwork for new digital broadcasting stations that will

serve such major population centers as Toronto, Windsor, Ottawa, Montreal, Quebec City, Calgary, Edmonton, Vancouver, and the Fraser Valley.

Currently, about 30 Canadian radio stations are DAB ready, including CHUM-FM, CBC Radio One, CBC Radio One Vancouver, CHOM 93.7 FM, and CJAD 890 AM.

But the goal of DRRI is not simply to make standard radio broadcasts sound better. Its long-term goal is to change the nature of radio itself. Korman wants to see a new kind of broadcasting that gives listeners more content and flexibility.

With a digital signal, a listener can tap into a wider range of content on a wider

range of devices—not just a radio, but one kind of wireless or portable device that has the necessary built-in receiver technology.

But it could be a mistake to simply think of digital radio broadcasting as a radio version of the Internet.

"Digital radio broadcasting does not have a return channel," adds Korman. "It is a point-to-multipoint technology, but it is broadcast and it can throw out a huge amount of data that can be configured to include subscriber services or to enhance already existing content."

Korman says it won't be long before we begin to see digital radio subscription

Continued on page 36

Canadian bulk at current fee

Continued from page 52

months, only 15 percent still said they would still consider paying at all, and only four percent said they were "very likely."

For college publishers and librarians, the problem might not be that Canadians are disappetened. Instead, Open-Book and Internet users might not see the value in paying for content that seems to be easily obtained for free.

Marion Seymour, Ipsos Reid's senior manager of research in Vancouver, said, "While a 'pay for content' model may be something achievable long term, it simply is not a viable option while so much con-

don't remove me from the Web

"For any one site to succeed with this model, the large majority of sites must agree to support it," she said. "Otherwise, a site which chooses to charge for its content needs to offer an extremely enticing package that competitors simply cannot offer for free."

The Ipsos-Reid survey found that Internet users were more agreeable to paying a 'donation' for their favourite Web content than they were fixed subscription rates.

The researchers said 17 percent of Canadian Internet users said they were at least "somewhat likely" to make a dona-

two to keep their favourite Web site running. Eighty-one percent said they were either "somewhat satisfied" or "very satisfied" to do so.

Forerough said that what survey respondents say they will do and what they actually do can be two different things, but he said the number of those who say they might make a donation to their favorite Web site suggests that users make it up for their own terms.

"They can decide the amount to donate and the frequency," he said.

Ignis Real said that just eight percent of Canadian internet users have reported reasons for online content in the past. That

suggests that they're tighter with a back pocket than those in the U.S., where a recent study came up with a double-digit share of surfers that had paid their own

Content Intelligence, the digital-publishing division of the Newtonville, Mass.-based print-industry intelligence firm Ilya Research, said in May that as many as 15 percent of U.S. Internet users had paid for Internet content at least once.

However, of those who said they had paid for content online, 45 percent acknowledged buying access to adult or sex-oriented material.

—Newspoint

The screenshot shows the homepage of CSCompuSolutions Depot. At the top, the site's name is displayed in a large, stylized font. Below the header, there are several promotional banners and product listings. A prominent banner on the left features the price '\$219' in large, bold text. To the right of this, there are columns of text and small images representing different computer components or systems. The layout is typical of an e-commerce website from the late 1990s or early 2000s, with a focus on displaying a variety of products and their prices.

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Careers & Training

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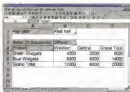


Summarizing 3D data in a snap using the PivotTables and Chart Wizards in Excel. In addition to calculating data, Excel is very good at summarizing it. It can make short work of reducing large amounts of information into very small, yet powerful summaries.

The key tool for summarizing data is the PivotTable and the associated PivotChart, which is a graphical version of the PivotTable.

This month we'll take a step-by-step look at how to create a PivotTable and chart for summarizing data. We'll show you how it's done, then you'll be able to follow the same process with your own data.

The steps that follow are based on Microsoft Excel 2003. If you're using Excel 97, however, you'll find it doesn't



Excel's flexible tables make short work of summarizing data.

include Pivot charts but you can follow the process similar to creating the PivotTable. If you're using Excel 10, simply follow these instructions.

Working data

Before you can create a PivotTable and chart you'll need some data. Let's assume you're working for a business that has two offices and that it records details of the

sales of green and blue widgets for each office for each business quarter.

We'll create four sample workbooks to record this information for a full year and use that as the data we will summarize. If you know how to create a PivotTable for a small sample of data like this, you can then easily create one for much complex data.

To begin, open a new Excel worksheet and check that it contains four or more sheets. If not, choose Insert, then Worksheet to add a new sheet, and repeat this step until you have the four sheets required.

Click the tab for Sheet1 and enter the data in the following table on the cells in this sheet:

Continued on page 100

Java Tutorial: Part 10

File input, output

By Jacques Savoyeur

In our last tutorial, we discussed the use of a `String` parser in the context of all the different situations in which you need to write programs that support deciphering of simple or even complex compound lines. But we left one part of the exercise to be done—creating the file and reading records from it.

The first part of this tutorial will be concerned with finding out whether a file or directory exists and what its characteristics are. There are the methods associated with managing files and directories programmatically in Java. You can see whether a file or directory exists, rename the file or directory, delete it, and perform other basic file operations, including setting file permissions for the executing application.

Basic file manipulations

The basic operations associated with a file are testing whether it exists, finding out where it is, and so forth. These are typically the tests associated with basic file input and output operations. If access supply a `File` class for reading, we need to find if that file exists and some of its characteristics. The program below illustrates these facts:

```
import java.io.*;
public class FileTest {
    public static void main(String[] args) {
        if (args.length == 0) {
            System.out.println("Usage: java FileTest <file>");
            return;
        }
        File file = new File(args[0]);
        if (!file.exists()) {
            System.out.println("File does not exist.");
            return;
        }
        System.out.println("File exists: " + file.getAbsolutePath());
        System.out.println("File size: " + file.length());
        System.out.println("File is directory: " + file.isDirectory());
        System.out.println("File is file: " + file.isFile());
        System.out.println("File is hidden: " + file.isHidden());
        System.out.println("File is readable: " + file.canRead());
        System.out.println("File is writable: " + file.canWrite());
        System.out.println("File is executable: " + file.canExecute());
    }
}
```

Continued on page 100

Three XML books worth reading

By Jacques Savoyeur

Back in November 2000, reporters covering the first beta release of Visual Studio were treated to an exceptionally rare event. Microsoft chairman Bill Gates in an impromptu mood. We were able to ask on-the-spot burning questions of Gates for about half an hour. Lynn Hershman of Princeton Press asked one of the best: "Now that Netscape and the Internet no longer keep you up at night, what keeps you worrying now?"

Gates was quite forthcoming and started, with barely a pause, that keeping track of the past "big thing in programming" was his chief worry, and that XML, and all its variants, was occupying most of his attention. And he's right.

In the past three years, XML (extensible markup language) has moved from being a midway language for the Web to being

the standard for sophisticated, cross-platform data interchange (XML, XSL, XSD, XSLT, SOAP, WSDL, and UDDI are key technologies) and is emerging as a powerful

Another declarative, markup language along with HTML and SQL joins the list of "must-knows" for all programmers worth their salt.

standardized distributed computing methodology for process-to-process interaction (XML, XSL, SOAP, WSDL, and UDDI are key technologies). But XML is also pivotal in emerging technologies such as metadata search (XSP and XQL), powerful browser formatting options.

Continued on page 102



Summarizing data
Continued from page 99

Cell Contents

B3	Cost of Sales
B4	Blue Widgets
B5	Total
B6	Cost of Sales
B7	Total
B8	Total
B9	Total
B10	Total
B11	Total
B12	Total
B13	Total
B14	Total
B15	Total
B16	Total
B17	Total
B18	Total
B19	Total
B20	Total

Enter the formula =B3:B5 into cell B6 to add the sales for the Central region, and copy this to cell C6. Into cell B7 enter the formula =B6:B8 and copy it to cells B8 and B9.

Now, to use this data to create the remaining three worksheets, log right the cells from A2:D5 and hold the Shift key as you click the tab for the fourth sheet in the book – i.e., four worksheets should now be selected. Choose Edit, Fill, Across Worksheets, then choose All in the Fill Across Worksheets dialog box and click OK. You now have four identical worksheets. Name them Quarter 1, Quarter 2, Quarter 3, and Quarter 4 by double-clicking each sheet tab in turn and typing the name for that sheet.

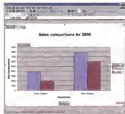
Making the table

Now that you have some data to work with, you're ready to create the PivotTable that will summarize it. Begin by selecting the Quarter 1 worksheet, then choose Data, PivotTable, and PivotChart Report. (If you're using Excel 97, select Data, then PivotTable Report) to start the PivotTable and PivotChart Wizard.

In Step 1 of the Wizard, choose the Multiple Consolidation Ranges option as the data you'll be consolidating; choose PivotTable as the type of report you want to create, and click Next. In Step 2a, choose the option I Will Create The Page Fields, and click Next. The page field will be a half year in which you'll group Quarters 1 and 2 together. Do the same for Quarters 3 and 4 to display them in the second half of the year.

In Step 2b, begin by selecting each area you want to consolidate. Click in the Range box, then click the collapse button at the far right. The page mouse to select the range B2:C4 on the Quarter 1 sheet, then click the collapse button again to return to the dialog box. The contents of the Range box should now read Quarter 1\$B\$2:\$C\$4, click Add to include in the list. Repeat this three more times to add the range A2:C4 for the other sheets, Quarters 2, 3, and 4.

Now choose 1 as the number of Page fields for your PivotTable. Choose each



Once you've created a PivotTable, it is only steps to create a chart (shown). The chart works in similar fashion to the PivotTable.

Quarter in turn and, in the Field area, for each quarter type this data:

Field one
Quarter 1
First half
Quarter 2
First half
Quarter 3
Second half
Quarter 4
Second half

Click Next to continue. If you're using Excel 97, you'll organize how the data from the sheets will appear in the PivotTable in Step 3 of the Wizard. For now leave this as it is and accept the default layout. Click Next to move to Step 4 of the Wizard.

If you're using Excel 2000 you can see the Layout screen that appears automatically in Excel 97, if you click the PivotTable button. Here you see a sneak up of the PivotTable and the current arrangement of data elements in it. You can

change the arrangement of the data elements by dragging and dropping them into new positions. You may want to take a look at this screen just for interest's sake. Excel's default layout will work just fine and, because this screen can be very confusing, it is a plus that Excel 2000 protects you from ever having to work with it by having a "Behind a button".

In both Excel 97 and 2000, click the Options button to set the Options for the PivotTable. In the Name area type Annual

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Discussion & Conclusions

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Linking Oosthuizen's Memo

Continued from page 18

Categories: [user](#) [notes](#)

When you have your Notes assigned to Categories, you can view them by Category. Choose View, Current View, and By Category. A Note belonging to more than one category will appear in each category view selected. Return to the original (default) view by choosing View, Current View, then Icons.

Offense by railroad

If you assign Notes a colour according to your own criteria (blue for private, yellow for urgent, for example), you can view the Notes ordered by colour by choosing View, Current View, then By Color.

Small note

You can share a Note with others by simply emailing it to them. Right-click the Note you want to send and choose Forward. A new message dialogue will appear and you can type the recipient's email address and send it on its way.

Note to the user: This is a pre-proof of a manuscript accepted for publication in the *Journal of Management Studies*. The manuscript is not yet final and may be subject to change. The final version of the manuscript will be published in the *Journal of Management Studies* in the near future.

When a Note contains so much information you'd rather it were in a document file, you can do this very easily. Open the Notes folder, click the Note you want to save,

choose File, then Save As. Give the file a name, then open it in Word or another word processor that supports RTF files.

18. There is a Master and a Slave?

A Note doesn't have to be stored in the Notes folder. In fact, you can put one just about anywhere. Select your Inbox and choose File New, then Post In This Folder. A dialogue will appear and you can type a subject and message. Then click Post to post it. It will still appear in your message list with an icon indicating that it's a Note.

Turn a Noise Into an Appointment

You can create an appointment by dragging and dropping a Note onto the Calendar folder. A new Appointment dialog box will appear with the text of the Note already inserted. Complete the details and choose Save and Close to continue.

Source: www.ck12.org

Like any Outlook object, you can search for text inside a Note by clicking on the Notes folder; then clicking Find. When the Find box appears, type the text you want to search for and click Find Now to locate all the Notes containing your text. ☐

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Endnote

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